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INSTRUMENT NOMENCLATURE WITH REFERENCE TO INSTRUMENTATION.*

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INTRODUCTION.

The want of some recognized scheme of Nomenclature and Classification of Dental Operating Instruments that will individualize the instruments of the several orders and classes is a great bar to progress in teaching instrumentation. This is apparently severely felt by all who labor for exactness in their operations, or endeavor to express the manner of their performance and to speak of the instruments used. The teacher has no means of telling his pupils just what particular instrument he would use in performing a specific act in excavating a given cavity or preparing a margin. The only means of individualizing excavators and pluggers, the instruments which present the most important variations, has been the manufacturer's number. These numbers have not been used by the profession, except occasionally for ordering instruments from catalogues. An extended study of these numbers develops the following facts: When an instrument is designed that is thought to be a good pattern the manufacturer assigns it a number. The pattern is preserved as a guide to the reproduction of the form and each instrument produced is stamped with its number. In this way hundreds of instruments are numbered without system. Finally, to rid himself of the multitude of instruments and numbers, the manufacturer collates those forms that sell best and throws out the rest. He then renumbers those retained, and enters them in the new catalogue. In this

*This paper as printed for reading before the National School of Dental Technics was copyrighted, because it was seen that a revision would be necessary, and it was not desirable that it should be generally published before such revision.

way instruments of similar pattern are for a time brought nearer together in the numbering. But the process of adding new numbers begins again and soon it becomes another confused mass. There has never been any system of numbering that indicated either the form or use of the individual instrument. It has been purely arbitrary. For this reason, the numbers have not been used by teachers, except for the one purpose of making lists from which the students should do their buying.

A dentist needs some means of indicating precisely the forms of the instruments used in the operations he endeavors to describe, and especially is this badly needed in school work. So long as the teacher has no means of accurately designating the particular instrument he employs, so long will his manipulative teaching be vague and uncertain. The pupil will be unable to know just what is meant, and any description of the manner of using individual instruments will be confusing and without force.

Not only this, but the confusion gives rise to an unnecessarily great multiplicity of instrument forms. We being unable to teach manipulation, the student fails to learn the range of valuable instrument forms, and the powers and capabilities of instruments, and is therefore continually seeking new forms, hoping to find that which will serve him better. This being done without accurate appreciation of mechanical laws, the vast majority of efforts are failures, which tend only to further confuse the manufacturer's numbers.

It should be regarded as a truism that the really capable instruments are strictly limited in present modes of operating by definite laws of usefulness that no man can put aside, and that the valuable forms continue in our cases year after year.

Special instruments for special purposes there are, and many of them fitted only for individual idiosyncracies in operating. Radically new instruments of value in the line of excavators and pluggers come forward now-a-days only as modes of operating are so changed as to require new forms. This kind of growth will continue. That which is needed now in the line of excavators and pluggers is a strict classification of the useful forms and the development of a scheme of nomenclature for the individual designation of each form. The presentation of such a scheme to the pupil will place before his mind the range of possible forms from the mechanical standpoint, and will enable him to know quickly what has been

produced, and in a much fuller sense than heretofore to know what can be produced.

This failure to appreciate instrument forms and the special usefulness of each form gives rise to great confusion in operative procedures. The disagreement as to method among dentists is unnecessarily great, and when such a degree of confusion exists only a very few of the methods can be the best. We should be able to teach methods in our schools. Can we do so without the ability to designate accurately the means of carrying out the method? The carpenter would not buy an auger that had not been made to a definite formula. The carpenter's boy would be laughed at, if, when sent for a quarter-inch auger, he should bring a seven-eighths. Can we not appreciate the forms and sizes of our instruments as definitely?

What our students need in the beginning of school work is a close drill in the appreciation of the forms of cutting instruments and pluggers, such as will enable them to discover the peculiarities of each with exactness, as to width, length and inclination of blades, and the proportions of the several parts. Also they should be instructed as to the possible variation of useful forms. Directly coupled with this, the student should be taught to record the forms for future reference; and, it would be well for him to acquire the skill to reproduce them from the record. If this be coupled with a careful drill in the uses and capabilities of instruments, an impression will be made on the mind, and a skill acquired by the hand that will be a great aid in the development of manipulative ability.

It is my object to develop the details of a scheme of instrument nomenclature and classification applicable to cutting instruments and pluggers, by the use of which the teacher can reach exactness in teaching instrumentation. This will be attained by first defining and arranging in an orderly way the words of instrument nomenclature that have been developed in the ordinary speech of the profession, by use of which groups of instruments may be definitely known; and then arranging a simple system of formulæ by which individual instruments of each group may be accurately designated.

It can not be expected that this proposed scheme for the classification and study of instruments will be of special benefit to dentists now in practice. That is not its object. It is intended for school work only; but may in time spread to the general profession through the students who go out from our schools.

Another object of the scheme is to limit the number of forms of instruments employed, and to adopt a classified list for school work that shall be sufficient for all schools and not be cumbersome to any. This can be done by selecting a sufficient classified list to be used in teaching, and from which each school may select the particular instruments the students will be required to have. This particular feature of the scheme will be more fully developed later. Or, instead of selecting a sufficient classified list for all schools to select from, each school may select its own classified list in accordance with a specified set of rules for the arrangement of instrument sets. A plan for doing this will be developed later, by which any classified set of instruments will be perfectly comprehended in the minutest detail from the written statement by any one familiar with the scheme of classification, and who has attained a working knowledge of any single set of instruments so classified. Also, such instrument sets may be accurately made by any skillful instrument maker without other guide than the written formulæ and the rules that will be developed in this paper.

This paper will be in two parts. The first part will consider and arrange the nomenclature heretofore developed, and the second part will be devoted to the consideration of formula names and the formation of instrument sets.

PART FIRST.*

INSTRUMENT NOMENCLATURE.

[Furnishing the Basis for School Instruction.]

In the development of any system of nomenclature, the basis should be the names that have arisen in the common speech of the profession. These names have a meaning, and, if we gain an understanding of this meaning, we will be able to classify the names in accordance with it, and in so doing present an orderly nomenclature. In doing this it is often necessary to choose between two or more names that have been applied to the same thing and occasionally to separate two items that have been called by the same name. In this way the uncertain nomenclature in vogue, developed at random in the first instance, is rendered orderly and definite. This is readily done in instrument nomenclature, and without the introduction of any considerable number of new terms.

*Some portions of this was given the National School of Dental Technics at Asbury Park in 1895 by Dr. D. M. Cattell, but it is thought best to give it here complete.

NAMES OF PARTS OF INSTRUMENTS.

Cutting Instruments, or Excavators.—Each excavator is composed of a shaft which is used as a handle, a shank and a blade. Usually in excavators the shaft is perfectly straight and without variation in size. The *shank* begins with the first turned part and connects the shaft with the *blade* or working point. It usually tapers from its connection with the shaft to where the blade begins.

The *blade* is the part bearing a cutting edge. It may be said to begin at the angle which terminates the shank—the last one, if there be more than one angle—and ends in a cutting edge.

Pluggers have no cutting edges and therefore no blades, as “A blade is the leaf-like portion of an instrument bearing the cutting edge.” The shank of pluggers, therefore, extends to the working point, though they may have similar angles to the excavators. (We should have a specific name for that portion of the plugger corresponding with the blade of the excavator.)

CLASSIFICATION OF NAMES OF OPERATING INSTRUMENTS.

Existing names of operating instruments may be divided into Order names, sub-order names, class names and sub-class names (4).

An *Order name* is one designating such instruments as are used for a purpose so similar that groups have received a name indicating the purpose of their use, or answers to the question, “What for?”

The well defined order names are *excavators*, *pluggers*, *separators*, *scalers*, *finishing instruments* and *accessories*.

A *Sub-order name* is one designating the locality, position or manner of use, in such a way as to distinguish certain instruments from other members of the order, or answers the question, “Where, or how used.”

A *Sub-order name* is often attached as a prefix to the order name, as *hand plugger*, *mallet plugger*, *push scaler*, *pull scaler*, etc. *Enamel Trimmer* is a sub-order of excavators. *Burs* belong both to Excavators and Finishing Instruments as sub-orders, as *cavity bur*, *finishing bur*. The word *Bur* is properly a class name—they have no order name.

A *Class name* is applied to a group of the members of an order and describes the point or immediate working part, as *hatchet* or *hoe*, descriptive of the blades of excavators, or the working point of pluggers, as *convex plugger*, *serrated plugger*, *smooth plugger*, etc.

producing excellent instruments, multiplies the number of instruments in the operating case to such a degree as to cause confusion. For this reason the formation of beveled rights and lefts should be very strictly limited to enamel instruments, or to special instruments for heavy cutting.

LATERAL CUTTING RIGHTS AND LEFTS.

True Double Plane Instruments.—The double plane, or intersecting plane rights and lefts are a totally different class of instruments, and are designed for lateral cutting, while the other forms, single plane instruments, are for direct cutting. If any of the single plane instruments be laid upon a table or any plane surface, in a certain position, it will readily be seen that all of the angles and curves, no matter how many, are in a single plane. If it is held before the eye, in a certain position, the instrument appears straight—such instruments are suited for direct cutting.

If we carefully examine the rights and lefts known as spoons or rapid excavators, it will be noted that each has an angle or curve that is not in the same plane with the principal angle or curve, but in a plane that intersects the plane of this principal angle at right angles. These we will call *double plane* instruments—they differ essentially from the single plane instruments in that they are specially suited for lateral cutting. They are always made in pairs. They are first formed similarly to the hatchet excavators, but after the blade is formed the blade of one is curved to the right and the blade of the other is curved to the left. This important division of cutting instruments is confined mostly to what has become known as spoons. They are suited to scooping out masses of carious material. They are not of much value for cutting hard material. This form of rights and lefts is also used occasionally in pluggers.

DEFINITIONS OF CLASS NAMES.

A *class name* is one that describes the immediate working point of the instrument.

CLASS NAMES OF EXCAVATORS.

Hatchet.—The shank has one or more angles or curves, the last length forming the blade, the edge of which is in the plane of the angle or angles.

Hoe.—The shank has one or more angles, the last length forming the blade, the edge of which is in a plane intersecting at right angles the plane of the angle or angles.

A *Sub-class name* describes the angles and curves of the shank leading to the working point or blade, as *bayonet plugger*, *spiral plugger*, *contra angle hatchet excavator*.

In the common speech of the profession, these names have been habitually compounded. Sub-order names are prefixed to order names—as in *mallet-plugger*, *hand-plugger*, etc. Class names are prefixed to order names, as in *hatchet excavator*, *spoon excavator*, *hoe excavator*, etc. Also sub-class names may be prefixed to either order or class names, or all these joined, as in *contra angle hatchet excavator*, or in *bayonet plugger*.

In all these compoundings, the order name is last, indicating the use or purpose—the sub-order name prefixed, indicating how or where, while the class name is descriptive of the forms of the working point, and the sub-class name the form of the angles and curves of the shank leading to the point. It should be noted particularly that these terms are applied to groups of operating instruments. They specify the kind of instrument but do not individualize the instruments of the group. These may vary indefinitely in the widths, lengths and angles of blades. For these differences we will propose other terms.

RIGHTS AND LEFTS.

There is a distinct division in operating instruments, known as *Rights and Lefts*. Among excavators we have two forms of rights and lefts. The *beveled* rights and lefts and the *lateral cutting* rights and lefts, or, true double plane instruments. The beveled rights and lefts are hatchet forms made rights and lefts simply by the form of the bevel of the cutting edge. Most of the hatchet forms have bi-beveled edges, i. e., the edge is formed by grinding equally from the two flat sides of the blade. The beveled rights and lefts are formed by making two hatchet forms alike, and then grinding the bevel all from one side on the one, and all from the other side of the blade on the other. The result is a pair of instruments, the one suitable for shaving down the buccal wall of a cavity, and the other suitable for shaving down the lingual wall. The cutting edges are upon opposite sides of the blades, making them rights and lefts. These are used mostly for cutting enamel in opening cavities, but may also be used very effectively in cutting dentin. Any of the hatchet excavators may be made in pairs and converted into beveled rights and lefts, but the general adoption of this, while

ward (from the direction of the cutting edge), and nearer the cutting edge another bend is made forward—this length forming the blade, the object being to form a long blade, the edge of which will be near the central line of the shaft.

Binangle Contra Angle.—A contra angle formed by two angles as described under contra angle.

Triple Angle Contra Angle.—In an instrument of the angle of 12 centigrades or less (about 45 degrees)—the binangle contra angle will bring the cutting edge sufficiently near the central line of the shaft, and at the same time carry the shank sufficiently out of the way to permit the use of the full length of the blade; but in instruments of a greater angle, a binangle would not do this, therefore a triple angle contra angle must be made; this is done by first bending the shank backward as in the binangle contra angle and then forming another angle which will bring the remainder of the shank parallel with the shaft; then passing forward a space of more or less length as may be required, another bend is made forward by which the blade is formed. In this way the cutting edge of a long blade is brought sufficiently near the central line of the shaft for effective work, and the shank carried sufficiently out of the way to permit the full use of the length of the blade.

Long blades that require contra-angling are mostly for use in places where a long reach of blade is necessary.

There are a number of other sub-class names that have been applied to excavators, but as none of them will be used they will be passed by for the present. Also, there are a number of sub-class names applied to plugger points, as cork screw, cow's horn, bayonet, etc., but as we shall not fully consider pluggers in this paper, they will also be passed.

Curves occur among the rights and lefts or double plane instruments for which no distinctive names have been developed. Those forms which I designate as spoons have a curve beginning at about one-third the length of the blade and gradually increasing to the cutting edge. Another form often seen, but which now seems to be in less favor, is what I should term the hoe spoon. This blade is straight like that of a hatchet until near the cutting edge, when it is bent laterally at an angle, and the cutting edge rounded as in the spoons. These are in pairs, as the spoons, and are true double plane instruments.

Spoon.—These are always made in pairs. They are first made in the form of hatchets and then the blade of the one is curved to the right and the blade of the other is curved to the left, then the cutting edge is ground to a semi-circle. This curve of the blade is in a plane that intersects the plane of the principal angle or angles at right angles, making the instruments true rights and lefts.

Discoids.—(Disc-like, circular.) The blade is circular in form, having a cutting edge extending around the whole periphery, except that portion by which it is joined to the shank. This circular blade is placed at more or less of an angle with the shaft.

Formerly this form was called a spoon, several forms being grouped under that name. Discoid blades are sometimes seen on double plane instruments of various forms.

Cleoids.—(Claw-like—in the form of a claw.) Sharp pointed blades in the form of a claw, with cutting edges on two sides of the blade.

Chisels.—Straight blades with cutting edge formed by beveling from one side. The blade is usually straight with the shaft, but may be slightly curved.

Binangle Chisel.—A chisel blade placed at a slight angle with the shaft in the hoe form. They are contra-angled.

Rotary cutting instruments will not be included in this list.

SUB-CLASS NAMES.

A *sub-class* name is one applied to and descriptive of the angles and curves of the shank of an instrument which leads to the blade or working point.

Mon-Angle.—An instrument having one angle only leading to the working point as in pluggers, or forming the blades as in excavators. Mon-angles form a large majority of excavators. In the greater angles only the shorter blades can be successfully used as mon-angles, for the reason that when the blade is long its inclination carries its working point laterally so far from the central line of the shaft as to render the instrument liable to turn in the hand when the edge is forcibly applied. This renders the instrument unsteady and ineffective. To remedy this defect, all cutting instruments, in which the angle and length of blades will carry the cutting edge more than 3 millimeters from the line of the central axis of the shaft, should be contra-angled.

Contra Angle.—The shank of the instrument is first bent back-

Other forms that have been used are almost endless, many of them without names, and very generally have disappeared under the law of unfitness for the purposes intended.

RULES FOR CONTRA ANGLING.

RECAPITULATION.

1st. All blades, the angle and length of which will bring the cutting edge more than three millimeters from the central line of the shaft, should be contra-angled.

2nd. All instruments with angles of 12 centigrades or less, when requiring contra-angles should be binangle-contra-angles.

3rd. All instruments with angles of more than 12 centigrades, when requiring contra-angles should be triple-angle-contra-angles.

4th. When the contra-angle is used the cutting edge of the instrument should be brought within two millimeters of the central line of the shaft, or better—when the contra-angle is used the working edge should be brought just so near the central line of shaft that when the instrument is laid edge downward upon a plane surface the edge should just touch, but not actually rest upon the surface.

SECOND PART.

FORMULA NAMES.

The names which have thus far been developed are sufficient for the designation and easy recognition of instruments belonging to any order, sub-order, class or sub-class. They are not sufficient, however, for the recognition of the individual instruments of any one of these divisions of forms. The blade of a hatchet or hoe excavator may have an angle with its shaft varying from a slight inclination to a quarter of a circle, or even more. Any angle of blade between these may be effective for some particular operation. A similar variation occurs in the widths and in the lengths of blades. An examination of the excavators on sale in our dental depots shows that the widths of blades vary from two-tenths to fifteen-tenths millimeters. The lengths of blades vary from two to about ten millimeters. Any width or length between those mentioned may be effective in some particular operation.

Now any of the widths may be combined with a great diversity of lengths and these again may be combined with a great diversity of angles. We readily see that in this way we arrive at a vast multitude of slight variations in these instrument forms, and any attempt to specify individual instruments without some rules for limiting the number becomes hopeless.

I took up this matter as a subject of study a number of years ago, with the thought that these instrument forms, or a sufficient number of them, could be specified by formulæ, as is done generally with mechanics' tools; as the quarter-inch auger, half-inch chisel, etc. In this study I was at first led into a very complicated system of measurements, which I considered too complex to introduce into school work. But the need of some available system has been so constantly apparent that the subject has not been allowed to rest. Work has been renewed at intervals with each new thought obtained; and finally the idea of a strict limitation of instrument forms in breadths, lengths, and angles of blades has been arrived at. The carpenter will not buy an auger or a chisel that has not been made to a definite formula—a definite measurement. This is true of mechanics' tools generally. They are all made to specified formulæ. It may be said that the mechanic's drills are made to definite formulæ in order that he may fit bolts made to similar definite formulæ, and that the dentist does not do this. True, but the mechanic also uses these formulæ in naming both his drills and his bolts that he may know them. Why should not the dentist have his instruments made to definite formulæ in order that he may know them, and designate the one fitted for a special act in excavating? Why should he have an infinite variety of forms without definiteness? No one dentist uses such a variety. Why should we not agree upon definite angles of the blades of hatchet and hoe excavators and combine with these angles definite sizes, or widths and lengths of blade? In this way we may gain a sufficient number of forms of cutting instruments and rule out all others. And then the thought has also come to me of arranging these in definite sets in which the formula names shall run on definite gradations for all of the instruments of each set, and in this way so construct them that they will be easily learned and remembered by students.

A strict study of the subject from this standpoint develops the fact that we do not need more than three, or at most four angles. Now with each of these three or four angles we will combine one long blade of definite width, one medium length of definite width, and one short blade of definite width, stipulating that the lengths and widths shall be the same in each angle. This makes a set of hatchets—if three angles be used—of nine instruments, and a set of hoes of nine instruments—or eighteen instruments in all. These

we may name the set of ordinaries. (See list of formulæ No. 4.) With this limitation of widths and lengths and angles of blades, and the regular order in which they occur, the difficulty of learning to know them by formulæ is reduced to a minimum. Indeed it is found in actual practice that the forms are known by sight as quickly as this simple list of formulæ is learned.

I have chosen and had made some sets of instruments upon this idea, and find from actual use that three angles is quite enough for my personal use. It is necessary only to add a list of spoons, enamel instruments, and a few long blades for reaching into deep cavities, to make the set complete. A list of special forms for special uses, the formulæ for which are constructed upon a similar plan.

It will be seen now, I think, that the infinite variety of widths, lengths and angles of blades without definiteness or restriction of any kind, except the fancy of those ordering instruments, is responsible for the chaotic condition of the forms of cutting instruments. It is my belief that for school work a strict limitation of instrument forms to those that may be accurately designated is desirable.

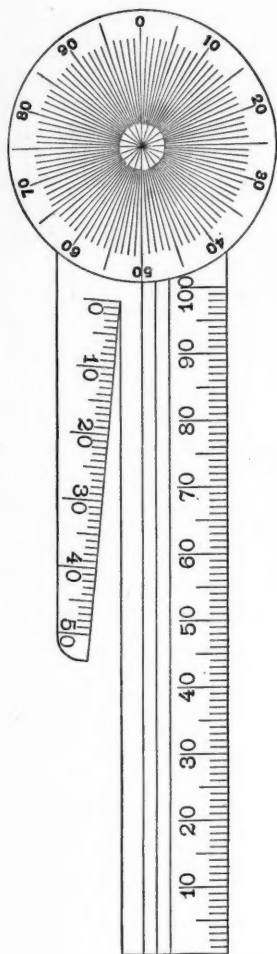
SELECTION OF SYSTEM OF MEASUREMENT.

If we have decided that a system of formulæ based upon measurements of widths, lengths and angles of blades is desirable, the next point will be to agree upon the particular system of measurement to be adopted.

For the measurement of widths and lengths we have the English inch and the French millimeter. Of these I should choose the French system for two reasons. *First*, from the present indications it seems that it will in time become the only system employed in scientific work. *Second*, the length of the unit seems much more convenient for the work; particularly is this the case if we use the tenth of the millimeter for all measurements of breadths and the millimeter for all measurements of lengths of blades. This seems to be so evident that I have adopted this, pending discussion.

The adoption of a system of graduation of the circle for the measurement of angles is a graver problem. The astronomical circle with its graduation of 360 degrees is far in excess of our needs and becomes cumbersome, because of the minuteness of its sub-divisions. On the other hand, it is the division of the circle most used and best known. The mariner's compass with its division of the circle into 32 points seems insufficient. The division

of the circle into 100, the centigrade circle, seems very much better suited to our needs. In this, 25 centigrades is a quarter of a circle, and equal to 90 degrees of the astronomical circle. The quarter circle is about all that we use and the graduations of this are much more quickly caught and appreciated than in the larger number of divisions. I shall use this pending further discussion.



THE GAUGE.

With the view of making the preparation for this work as nearly perfect as possible, I have had a gauge made in steel for instrument measurement. It consists of a circular head graduated in hundredths, and an attached bar ruled in parallel lines for the measurement of angles. The bar is also graduated in millimeters for the measurement of lengths. For the measurement of widths a supplemental bar extends beside the main bar, leaving between the two bars a gradual widening or V-shaped space, which is graduated in tenth-millimeter widths up to fifty-tenths or five millimeters. This is found very convenient for the measurement of widths of blades, the sizes of plugger points, and the diameter of burs.

FORMATION OF FORMULA NAMES.

For the formation of formula names of excavators, three points are considered, viz, the width of the blade, the length of the blade, and the angle of the blade with the shaft. All other points are left to be guided by the rules that have been given in part first. These (width, length and angle of blade) are very exactly the

points that go to make up the individuality of the several instruments of any order, sub-order, class or sub-class, and will certainly identify each. The particular conformation of the shanks and the handles are left to the individual manufacturer, or, to the taste of the person ordering instruments. Neither is it considered important to this system that the angles be made sharp and definite, or that they be made in the form of moderately short curves. All such points in construction can be left to the taste of the manufacturer. At least the system now proposed does not take them into consideration.

THE MEASUREMENT OF INSTRUMENTS.

In the measurement of instruments for the formation of formula names, first try the width of the blade in the V-shaped slot of the gauge, which will give the width in tenth-millimeters, and set this down as the first figure of the formula. In this the tenth-millimeter is to be used as the unit. Next measure the length of the blade from the center of the angle to the cutting edge in millimeters and set that down as the second figure of the formula. In this the millimeter is used as the unit. Third, find the angle of the blade with the shaft and set that down as the third figure of the formula. In making this last measurement, lay the handle of the instrument on the main shaft of the gauge, parallel with the parallel lines, and with the point turned toward the small numbers of the circular head. Now move the instrument until the angle of the blade coincides with one of the lines graduating the circle, being careful to keep the handle parallel with the parallel lines.

If we have measured a hatchet and the numbers give—width, 12; length, 5; angle, 6, the formula name will read "Hatchet, 12-5-6." If it be a hoe, the formula will be the same and we call the instrument "Hoe, 12-5-6," the class name always preceding the formula name. This distinguishes both the kind of instrument and the size and angle of the blade of each. In this way we name each instrument of the set, no matter what its class and size, as "Spoon, 20-9-12" or "Spoon, 15-8-12," or "Enamel Hatchet, 15-8-12," or "Enamel Hatchet, 10-6-12," etc.

It is also understood that the edge of cutting instruments shall be at right angles with the length of the blade, unless otherwise specified. When some other angle is desired, it is measured in the large numbers in the last quarter of the graduated circle by moving the instrument without turning it over, and still keeping the handle

parallel with the parallel lines of the gauge until the angle of the edge coincides with one of the centigrade lines, and that number is set in brackets following the width number, thus, Gingival Margin Trimmer 20 [95]-9-12 or Gingival Margin Trimmer 20 [80]-9-12.

FORMING INSTRUMENT LISTS.

We have now made out rules of nomenclature by which we may accurately designate individual instruments. I will now explain the scheme for grouping instruments in formula lists which serve to limit the number of forms and to bring those chosen into intelligible order. The appreciation of the value of regular order in the formation of instrument sets has been arrived at rather slowly, and largely from studying the difficulties of students in learning the forms of their instrument points. With the methods that have prevailed few persons learn to think in their instrument forms. They have to search for the proper instrument instead of reading it in the case before them. It is that we may be able to teach pupils to think in their instrument forms that we strive to construct graded sets in formula nomenclature; and these should be placed on such lines of gradation, or be so grouped, that the mind easily follows from one to another throughout the set.

It is not difficult to do this with any of the forms of excavators, but some of them are more easily arranged than others. The ordinary hatchets and hoes present the greatest variations of size and angle of blades, but fortunately are the most easily graded into sets. Carpenters' augers are made in gradations of sizes of 1-32d inch, making the most perfect set. Another set is made on gradations of 1-16th inch, this set containing but half the number of the first. Still another set is made on gradations of 1-8th inch, containing but one-fourth the original number. Yet each of these sets is complete upon its individual lines, and each of the smaller sets is contained in the larger.

For the ordinary hatchet and hoe excavators we may readily do a similar thing by first constructing a list of formulæ on regular gradations that will cover the useful sizes and angles of blades, and then cut out all of certain dimensions or angles in the formation of shorter lists. This is not so readily done in spoons, enamel hatchets and some other forms, for the reason that in these we do not require so many instruments of a given class. These also require different formula names, for the reason that the blades are of different dimen-

sions from those of the hatchets and hoes. They must therefore be placed in a different formula list in which we can group together such instruments as agree in dimensions of blade. If necessary we may make several formula lists. At present I will propose three divisions, naming each, as follows:

Ordinaries are the common forms of hatchets and hoes, many of which are found in every operating case.

Specials are those instruments designed for special acts in excavating, such as spoons, enamel hatchets, chisels, etc.

Side Instruments.—These are selections for some particular purpose, only one or two of which are wanted in the instrument set, and which it is not desirable to include in a regular formula list.

ORDINARIES.

After a long and careful study of the dimensions, proportions and angles of blades of the hoe and hatchet excavators used by dentists and generally on sale in dental depots, I am of the opinion that nearly or quite every dentist will find in the following formula list about everything he will want:

SET OF ORDINARIES NO. 1.

14-6-6, 12, 18 and 23.

12-5

10-4

8-3

6-2

4-1

forty-eight instruments.

Formula lists for ordinaries will be given in this form. The first figure gives the width of blade; the second the length of blade; the third the angle of the blade with the shaft; and the additional angles used are given in the first line only, divided by commas.

† Each of the dimensions of blade is to be made in each of the angles given both in hatchets and hoes. The list is to be read: Hatchet 14-6-6, hatchet 14-6-12, hatchet 14-6-18, hatchet 14-6-23; or hoe 14-6-6, etc., for the first line; and hatchet 12-5-6, hatchet 12-5-12, hatchet 12-5-18, hatchet 12-5-23; or hoe 12-5-6, etc., for the second line. This is continued in the same way for each of the dimensions of blade. *The formula of each instrument is stamped upon its handle as a convenience to the student in learning his instrument points.*

According to the rules for contra-angling given in Part First, page 10, hatchet and hoe 14-6-12 would be binangle contra angles. Also hatchets and hoes 14-6—18 and 23

12-5

10-4 would be triple angle contra angles.

There are in the set twenty-four hatchets and twenty-four hoes, or forty-eight in all, and if generally adopted as the full list of ordinaries would, I think, be found satisfactory.

In making shorter lists I would cut out all of certain dimensions of blade, or of certain angles, preserving the regular order of formula names for those retained. As the least desirable I would first remove all of dimensions 14-6 and 4-1, thus:

SET OF ORDINARIES No. 2.

12-5-6, 12, 18 and 23.

10-4

8-3

6-2

thirty-two instruments.

This set is a most beautiful gradation of the ordinary forms of excavators, and really embraces about all that any dentist would want in his case. But these are probably a greater number than most persons would desire.

For the next set I would remove all of the dimensions 10-4, thus:

SET OF ORDINARIES No. 3.

12-5-6, 12, 18 and 23.

8-3

6-2

twenty-four instruments.

This is also a very effective instrument set, but if there are still too many I should remove all of the angle 18 centigrades, thus:

SET OF ORDINARIES No. 4.

12-5-6, 12 and 23.

8-3

6-2

eighteen instruments.

This I regard as an especially desirable list for school work. It is the list I have used most except that I have used the dimensions 5-2 instead of 6-2, but in the future will use the 6-2.

Now, for a still shorter list, and the shortest that I could recommend as reasonably efficient, I would retain but two dimensions:

SET OF ORDINARIES No. 5.

10-4-6, 12 and 23.

6-2

twelve instruments.

This is a list of six hatchets and six hoes excellently graded to the requirements of the student—indeed I do not know how we could better select this number of instruments.

In the instrument sets given we have five, differing widely in numbers, but in each the formulæ are complete on the lines laid out and every instrument is a good one. The smaller sets are all contained in the largest, and are so arranged as to give manufacturers the least trouble in supplying classes. If manufacturers will make up List No. 1, or even List No. 2, and make these their stock instruments in ordinaries, there are few wants in this line that will not be supplied by them. From them any school that may desire to introduce the formula plan of nomenclature in teaching will be able to choose a satisfactory list. Within a few years this may become the plan of the dental profession, and the manufacturers will be relieved from the loads of dead instrument stock they are now compelled to carry. That other instruments in this line will be demanded goes without saying, but they will be fewer in number as discussion of plans and methods under conditions of greater accuracy of understanding proceeds.

SPECIALS.

In the list of specials I will give such only as I have defined in part first. These seem to me from my personal study and use of cutting instruments to be best suited to our present methods of preparing cavities. I will first give what I regard as a complete list, and afterwards cut it down to smaller numbers, removing such instruments as can be spared with the least detriment to effective school work. It is to be understood that each full instrument set is to contain a list of ordinaries and a list of specials. The list of specials will contain numbers of classes instead of a great variety of sizes and angles of two classes, as is the case with the ordinaries. We do not require many sizes and angles of blade in any one class of specials. After a careful study of them it is found that most of them may be arranged upon practically the same formula numbers. There are a few, as the straight chisels and the cleoids, which will

not require the full formula terms to sufficiently designate them. Three widths of blade seem to me to be the most that will be necessary, and nearly all may be of the angle 12 centigrades, a few only requiring the angle 6 centigrades. The length of blade may be on the same lines in all but the discoids, the length and breadth of which are necessarily the same.

LIST OF SPECIALS NO. I.

Enamel hatchets	20-9-12 Pr. R. & L. bevels.
Enamel hatchets	15-8-12 Pr. R. & L. bevels.
Enamel hatchets	10-6-12 Pr. R. & L. bevels.
Spoons	20-9-12 Pr. R. & L. curved.
Spoons	15-8-12 Pr. R. & L. curved.
Spoons	10-6-12 Pr. R. & L. curved.
Spoons	20-9-6 Pr. R. & L. curved.
Spoons	15-8-6 Pr. R. & L. curved.
Spoons	10-6-6 Pr. R. & L. curved.
Gingival margin trimmers . 20 (95)-9-12	Pr. R. & L. curved.
Gingival margin trimmers . 20 (80)-9-12	Pr. R. & L. curved.
Gingival margin trimmers . 15 (95)-8-12	Pr. R. & L. curved.
Gingival margin trimmers . 15 (80)-8-12	Pr. R. & L. curved.
Binangle chisel	20-9-6. One instrument.
Binangle chisel	15-8-6. One instrument.
Binangle chisel	10-6-6. One instrument.
Straight chisel	20. One instrument.
Straight chisel	15. One instrument.
Straight chisel	10. One instrument.
Discoid	20-2-12.
Discoid	15-1½-12.
Discoid	10-1-12.
Cleoid	20.
Cleoid	15.
Cleoid	10—thirty-eight instruments.

This gives a list of thirty-eight special instruments. Several other forms might be added, but to me they seem unnecessary. They can be added, however, upon the same plan of formulæ used in this list, or if necessary still another formula list may be arranged. This list will give rise to more difference of opinion than the list of ordinaries, for the reason that they are designed for special uses in excavating, and persons who excavate cavities differ-

ently are likely to want different special forms. Such differences, however, have no reference to the formula plan of nomenclature, as other forms can as readily be brought into this system.

In this list of specials each instrument is designed for the performance of a special act in excavating. The enamel hatchets are designed for chipping enamel by hand pressure in opening cavities in the bicuspid and molars. They are beveled rights and lefts and are somewhat distinctive in form and use. When the manner of handling them and their adaptation to place of use has been learned, they are unusually effective instruments. Indeed, besides their use in chipping enamel, they become the principal instruments for cutting out and forming both mesial and distal cavities in the bicuspid and molars, both upper and lower. Their angle of blade and form of edge is such that they naturally cut these cavities into proper form. And when properly supplemented by burs, they are very effective in extending these cavities for the prevention of the recurrence of decay at the gingival margin, or at the bucco-lingual and lingual-lingual angles.

The spoons are for the removal of carious or softened material in any position, but more especially in the large cavities in the bicuspid and molars, also for uncovering exposed pulps the broader blades are invaluable. Of these spoons the pairs in 12 centigrades angle seem to be preferred, though the 6 centigrades angle are the instruments heretofore generally in the market.

The gingival margin trimmers, two pairs of which are of one size, and another two pairs of another size, are for the one purpose of smoothing and beveling the marginal angle of the gingival wall in proximate cavities in the bicuspid and molars. For this purpose they have the cutting edge ground to a definite angle with the shaft. This is made 80 centigrades in the one pair, which fits them for mesial cavities, and 95 centigrades in the other pair, which fits them for distal cavities. The smaller pairs serve this purpose in places too narrow for the entrance of the 20 tenths width of the larger. These are the only instruments in the list that have cutting edges other than at right angles with the length of the blade.

Of chisels I have placed six on the list. Three of them are straight, and the width of blade only is given in the formula name, as chisel 20, or chisel 10. All have cutting edges at right angles with the shaft. Those designated as "binangle chisels" have the

full formula name with an angle of 6 centigrades. They are so contra angled as to bring the working edge in the line of the shaft. The six form a very effective set for chipping enamel in the opening of cavities, and in trimming the walls to form. The angles of the binangle forms adapt them admirably to the trimming of buccal walls in molars and bicuspid in places where a slight angle of blade is necessary to reach the best position for cutting.

The discoids perform much the same office as spoons, and are available in positions of easy access. When direct access can be had, they are to be preferred.

The cleoids are available for almost any purpose demanding a pointed instrument. I use them much in opening pulp-chambers in upper bicuspid, and in beveling lingual enamel margins in incisors, also frequently in following out fissures in the molars.

In forming sets of these of fewer numbers I would first cut out the list of spoons in 6 centigrades angle; second, the list of cleoids, and third, the discoids; fourth, the gingival margin trimmers 15(95)-8-12 and 15(80)-8-12, leaving the list stand thus:

SET OF SPECIALS No. 2.

Enamel hatchets	20-9-12 Pr. R. & L. bevels.
Enamel hatchets	15-8-12 Pr. R. & L. bevels.
Enamel hatchets	10-6-12 Pr. R. & L. bevels.
Spoons	20-9-12 Pr. R. & L. curved.
Spoons	15-8-12 Pr. R. & L. curved.
Spoons	10-6-12 Pr. R. & L. curved.
Gingival margin trimmers .	20 (95)-9-12 Pr. R. & L.
Gingival margin trimmers .	20 (80)-9-12 Pr. R. & L.
Binangle chisel	20-9-6.
Binangle chisel	15-8-6.
Binangle chisel	10-6-6.
Straight chisel	20.
Straight chisel	15.
Straight chisel	10—twenty-two instruments.

For a still shorter list, and the shortest list of specials that I could recommend, I would cut out from Set No. 2 all of the dimensions 10-6, thus:

SET OF SPECIALS No. 3.

Enamel hatchets	20-9-12 Pr. R. & L. bevels.
Enamel hatchets	15-8-12 Pr. R. & L. bevels.

Spoons	20-9-12 Pr. R. & L.
Spoons	15-8-12 Pr. R. & L.
Gingival margin trimmers	20 (95)-9-12 Pr. R. & L.
Gingival margin trimmers	20 (80)-9-12 Pr. R. & L.
Binangle chisel	20-9-6.
Binangle chisel	15-8 6.
Straight chisel	20.
Straight chisel	15—sixteen instruments.

This list is really quite effective, though one who has become accustomed to the smaller sizes will miss them.

Of these lists No. 2 of the specials, combined with No. 4 of the ordinaries, makes an excellent set for school work. It contains thirty-four instruments every one of which will come into active use in the ordinary infirmary practice.

Also set of specials No. 3 combined with set of ordinaries No. 5 makes a well-chosen short set of twenty-eight instruments that is quite effective for school work, though some very desirable instruments are missing.

These lists are extremely simple in their formula nomenclature and are easily learned by pupils. Of course other combinations of these lists may be made at will. Yet it is important that the direct relation of the formula names be carefully maintained in any lists made up for school use.

SIDE INSTRUMENTS.

Side instruments should be made to definite formulæ, that they may receive definite names. For instance, in breaking up the list of specials for the formation of smaller lists, discoid 20-2-12 may be retained as a side instrument, or one of the cleoids may be retained. I like to have in the instrument list as side instruments hatchets 5-3-28 and 3-2-28 for cutting retention grooves in the incisal angle of incisor cavities. It will be noticed that the formulæ of these latter do not follow the lines of the list given. The number of such instruments added to working sets in schools should be limited to a very few favorite forms for some special use. Any considerable number of them will certainly cause confusion in the minds of students, and interfere with the easy mastery of the list as a whole.

Other formula lists may be added when desired. This year I have used an additional list of long slender blades expressed thus:

Hatchets and hoes—12-8-12 and 23.

Of these the blades in 12 centigrades angle are most excellent instruments for deep cavity work, and yet my experience thus far in teaching leads me to the conclusion that the introduction of this third formula list is undesirable. In other words, instruments in the other two lists so nearly take the place of these that it seems undesirable to burden the students with the additional list.

There is really no limit to the number of lists that might be formed by this method, and if I have now made this clear I have finished my task in this direction. But the more important consideration is the limiting of the instrument forms to definite lines easily followed by the student and readily supplied by the manufacturer.

It must be distinctly understood that in ordering instruments by the formula plan the class name of each instrument must be given with its formula—as Hatchet 12-5-6, or Spoons 20-9-12.

It seems very desirable that some rule be established as to which instrument shall be called the right or the left in the instrument pairs. I will suggest that this be based on convenience of use in the right hand. That blade which, when held as a pen with the point downward, has the convex side of the blade to the right is called the right-hand instrument; and the blade which has the convex side of the blade to the left is the left-hand instrument. In beveled rights and lefts the beveled side corresponds to the convex side of curved blades.

TEACHING INSTRUMENTS AND INSTRUMENTATION.

When the time came for opening school this year, I felt that I could not begin without putting the plan for formula names to trial. The teaching of the mechanical forms, the adaptation of forms to the ends to be accomplished and plans of instrumentation were begun in Northwestern University Dental School this year under extreme disadvantage. It was really impossible that it should be otherwise in the beginning. It has come upon a class of three hundred and fifty pupils—juniors and seniors—after they have accomplished a part of their course by other methods, and with instruments of different forms. To make matters worse, on account of the slowness of manufacturers, together with the extraordinary demand for the particular instrument set used, only a portion of the pupils could be promptly supplied. This has been a great drawback to effective work. Yet the experience gained thus far has been a most valuable study of the effectiveness of the method and of the plans to be em-

played in teaching. Most pupils who obtained their instruments in time learned to read their points readily and have made rapid progress in instrumentation.

The proper place to begin this teaching is in the operative technic class; and for this purpose the pupil should be required to obtain his cutting instruments in his freshman year. One of the first and most important steps is to give the pupil a good working knowledge of the value of the millimeter, of tenths of a millimeter, and of centigrade angles. He should attain this in such degree that he will be able to cut bits of paper, or of some soft metal, five, ten or fifteen tenth millimeters wide, or five or ten millimeters long with reasonable accuracy without the use of the gauge; and to form any given angle. In this study he must first work with the gauge or with the printed form. A very excellent instrument for this study is the Boley gauge, an instrument that is specially well adapted to measuring teeth, and many other things in school work and in the dental office. As this is being accomplished the instrument forms are presented one by one, as hatchets, spoons, hoes, etc., and the mechanical features of each, the nomenclature of its different parts, and the relation of the instruments to each other explained. The capabilities of each form will be familiarized by exercise in their use in carving in bone, and forming cavities in teeth. In doing this, correct instrument grasps, and finger and thumb rests, will be taught. The pupil is then presented with the various sizes of each form and learns to distinguish them and to use their formula names.

In this way the pupil becomes fitted to enter the junior year in which this teaching begins to be put into actual practice in the mouth. Now a review of the instrument forms, their nomenclature, and the uses of each, is made in connection with the teaching of the preparation of cavities. In this the lecturer and the demonstrator at the chair become able to direct the student effectively, so that his use of instruments is begun correctly, and comparatively rapid progress made on right lines. This much neglected branch of operative dentistry, instrumentation, can now be taught effectively.

Cavity preparation, in my conception of it, should proceed in a definite order, step by step, which a student should be taught to observe strictly, to carry out with certain instruments, and with fairly definite methods of instrumentation. It is only when he is able to accomplish this work upon a definite system that he should

be regarded as able himself to form his lines of procedure in such a manner as will lead him to that high degree of skill in the future which we desire that our pupils should attain.

SECTIONAL PIECE OF PORCELAIN BRIDGE-WORK, ALLOWING THE REMOVAL OF ONE OR BOTH SECTIONS.

BY ADAM FLICKINGER, D.D.S., ST. LOUIS.

I herewith give cuts and description of a novel piece of sectional bridge-work. It has been of considerable interest to local dentists, and I trust it may prove equally so to readers of the *DIGEST*.

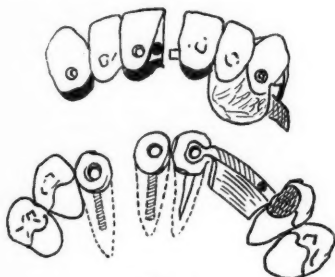


Fig. 1.

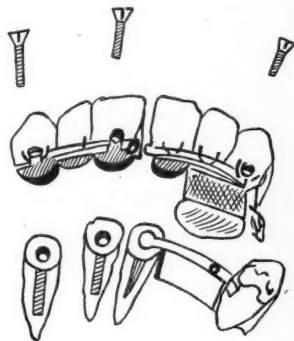


Fig. 2.

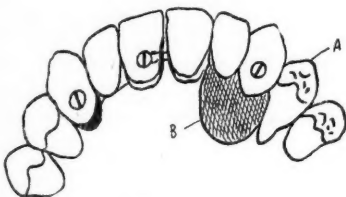


Fig. 4.



Fig. 3.

Figure 2 illustrates the skeleton before baking, the bar projection and the gold crown. Figure 3 shows cylindrical tube opening for bar projection. Figure 4 shows the case complete in the mouth. A is the gold crown to which the bar is soldered and B is the gum enamel, which is placed on the labial and lingual side of left lateral and cuspid to overcome an enormous shrinkage caused by loss of alveolar process.

The bands encircling roots of centrals and root of right cuspid are made of platina, 30 gauge. The bar and box fitting over it and the plate and screws are constructed of iridio-platinum.

Close's body and gum enamel are used for the porcelain, and are baked twenty-seven minutes in an electric oven.

Before screwing home, the inner part of bands are skimmed with Britton's cement, and the box, screws and cylindric tube are coated with chloro-percha.

TREATMENT OF TEETH IN A COUNTRY PRACTICE.

By DR. J. W. BEETHAM, D.D.S., FENNIMORE, WIS. READ AT TWENTY-SEVENTH ANNUAL MEETING OF WISCONSIN STATE DENTAL SOCIETY, JULY 20-22, 1897.

Your patient comes to you, perhaps from miles away, complaining of toothache, and what you do must be of a permanent character. Upon making an examination you find the cause is an exposed pulp, and decide at once to remove the same.

My method is as follows: Apply rubber-dam, wash out the cavity with warm water, then with pyrozone; next remove all debris and insert a small pellet of cotton saturated with carbolic acid, working it well against the exposed surface. Then take about ten minims of a 4-per-cent warm solution of cocain in the syringe—tell the patient it will be painful for a short time only—remove the cotton, apply soft rubber plug, pass needle through and well into pulp, discharge some of the contents and leave the needle for a short time. After two or three minutes the whole pulp can be painlessly removed with a spiral barbed broach. Wash the chamber well with pyrozone, repeating until it ceases to effervesce; flush with 95 per cent alcohol, and dry thoroughly. Do not depend entirely upon warm air for drying, but use copper wire heated in flame of lamp also. Wipe out canal with fine broach, wrap with shred of cotton dipped in eucalyptus oil, pump in chloro-percha, insert gutta-percha point, and fill cavity permanently as desired. The pyrozone breaks up the blood and washes it out, and also penetrates the dental tubuli. The oil following, being a solvent for gutta-percha, penetrates the cement, and being followed by the chlora-percha must seal the pulp-chamber permanently. In cases of severe hemorrhage, keep floating them with 95 per cent alcohol until it ceases.

My reasons for this method of treatment are: complete success with the minimum amount of pain; the unreliability of arsenic and the pain in removal after its use, and last but not least, the patient, after the pain has ceased, either forgets to return or is so far away that he cannot conveniently. I have been practicing this method over four years on most all kinds of teeth, and have had no trouble with teeth so treated.

Discussion. Several members spoke of severe pain following the use of eucalyptus, and asked the reason. Dr. C. C. Chittenden said that if it produces irritation a septic condition is present, which is thought to be under control but is not. In such cases it will act as an irritant, starting up whatever sepsis remains. Where eucalyptus oil can be used without disturbance it is pretty certain that the territory is aseptic.

INCIDENTS OF OFFICE PRACTICE.

BY E. B. OWEN, D.D.S., BROADHEAD, WIS. READ AT TWENTY-SEVENTH
ANNUAL MEETING OF WISCONSIN STATE DENTAL SOCIETY,
JULY 20-22, 1897.

Necrosis. Miss E., age 18, came to me suffering with a dull pain in the left upper side of face. Second bicuspid had been extracted three years before, but the socket had not healed. After examination I told her there was some dead bone there which would have to be cut out. She was somewhat alarmed at my diagnosis of her case, and objected to any such treatment. I compromised with her and said I would treat it two or three times, and if it did not submit readily I should have to resort to operation. After three treatments with peroxid and campho-phenique she received no relief. I then had her mother come with her and explained the operation to them, and said that it was the only means of cure.

After obtaining their consent I took some sharp burs, made with a long shank for this kind of cases, and after anesthetizing the parts locally, I removed all diseased tissue with the bur revolving rapidly, washed the socket out with peroxid and carbolized water, packed with gauze and told the patient to return in two days. At the third dressing I discarded the gauze and made a plug of beeswax. After washing with carbolized water at each sitting I dressed off end of plug. The wound healed up very quickly, and the patient has since experienced no trouble.

Miss R., age 31, suffered considerable pain over front of face. I found a condition similar to the other case over right superior lateral. The tooth had been extracted several years before, but the socket had never closed and would discharge at intervals. The left superior lateral was abscessed, with fistulous opening, and did not respond to treatment, not even to carbolic acid. Both centrals had dead pulps and were much discolored.

The necrosis was so extensive that I wished to consult better authority before operating, so I took the patient to the Chicago College and Professor Brophy approved of my diagnosis. He extracted the left lateral and proceeded to cut out the necrosed process, but the patient's nerves gave out, so he operated only on left side. He told me to operate on the other side later, which I did with success. The centrals were so badly discolored that he advised extraction. I dressed the wounds every day for a week, and then every two days until well. I then made a rubber plate with four anterior teeth and porcelain gum sections, and ground edges of gum to feather edge to fit nicely in depression.

Care must be exercised in dressing after these operations, so that the new tissue shall not be disturbed after it begins to form at the bottom of wound, which is caused to heal from the bottom up by keeping the top open with wax plug, trimming off a little at each dressing to allow room for a new deposit.

Case of Alveolar Abscess Extending Through Antrum, Causing a Chronic Inflammation of Entire Lining of Antrum. Mrs. C., age 68, general health poor and not able to come to the office. Her physician had treated her for neuralgia of left side of face for several years. I was sent for and extracted the four remaining teeth, the first and second molars on each side. A very long abscess came away with left buccal root of second molar, and a free discharge followed from the socket. I mistrusted the trouble, but as it was evening and the patient somewhat exhausted I did not investigate further, intending to call next day. Early next morning, however, her husband called at my office to say that his wife was having a discharge through her nose and asked me the cause, so I told him what I had discovered the evening before. Upon examination I found much tenderness on the inside of arch, and a watery pus discharge through socket of abscessed root, which extended into antrum. Washed out antrum with diluted peroxid, followed with a solution

of boracic acid, and gave mouth-wash to be used often. I was very anxious about this case, as the general health and age of patient were against a speedy recovery, so treated every day for one week, and every other day for two weeks. In six weeks patient was entirely well, never suffering again from neuralgia. She lived three years afterward.

Syncope. Professor K., weight 190 pounds, general health good, came for extraction of several badly decayed teeth. He wished the gums anesthetized, and informed me that he would faint away after each tooth, as he always fainted when hurt in the least. As I did not care to have him faint more than once at each sitting, I said he would have to make a visit for each tooth. I extracted one tooth with very little pain and he was much pleased; he talked for about a minute, and then over he went. That was all I could do for him that day, so made another appointment.

As I had never seen such a case before, I made up my mind that something had to be done. Fainting or syncope is the result of weak heart action, and my plan was to stimulate the heart before beginning operation. At the next sitting I gave him thirty-five drops of aromatic spirits of ammonia, and after extracting three teeth without any signs of fainting, I waited a few minutes and then extracted the remaining seven teeth with good results. Since then I always give it when a patient shows any signs of fainting. It is perfectly harmless, and I have never had a patient faint, no matter how severe the operation.

Discussion. Dr. B. G. Maercklein: In the cases described by Dr. Owen, the operations would not have been necessary if he had used a fifty per cent solution of the ordinary sulphuric acid, injecting into the carious pockets until the tissue was wholly saturated. Insert the point of a syringe into the abscess opening, closing latter with a little cotton or gutta-percha, so that the sulphuric acid will distend the parts; allow it to remain a quarter of a minute, and let it discharge of itself. Prepare beforehand a mouth-wash of water and bicarbonate of soda, so as to immediately neutralize the acid as it enters the mouth. Sulphuric acid is a very nauseous astringent and you will probably have some carbonic acid gas blubbering in the mouth, but that soon ceases. If done thoroughly it is seldom necessary to repeat, for the acid so disintegrates the dead bone that it comes away in the shape of debris, and can be easily washed out

with tepid or carbolized water the next day, which is about all the treatment necessary, as it heals of its own accord. This strength of acid is not at all dangerous, as it will not act on healthy bone.

Dr. Owen: In this case of four anterior teeth, with only a small discharge over each lateral, would sulphuric acid injected across the whole bridge free it of this bone?

Dr. B. G. Maercklein: Yes. In this case close the opposite opening if possible, so as to get some tension in the tissue. I used it in one case of carious bone of the lower jaw where every tooth had been extracted and all the sockets were carious, with a new growth of bone on each side of the sockets. It was pronounced by two expert surgeons as malignant, because the inner walls had extended back until the bone encroached upon the glands beneath the tongue, and one sublingual was sloughing nearly one-half inch deep, and the patient was told that the angle of the rami must be excised to save life. A few applications of sulphuric acid convinced me that it was merely a carious process of the lower maxillary. Nature made an attempt to restore the lost tissue, but did not seem to get into the center of the bone. The growth was simply upon the periosteal surface, and the bone in the center was very dense. I used sulphuric acid in that mouth twenty-five times before I had entire relief, and it had gone clear around the jaw and everything dead was eaten out. It was over a week before there was any positive evidence of healing, and three months before it entirely healed. When it did, however, there were two sharp edges of bone, one close to the lip and one close to the tongue, with a depression nearly one-half inch deep between them, yet covered over with mucous membrane and in a perfectly healthy condition. These sharp edges have since come down level; the body of the jaw-bone remains, and the face is not deformed.

NEW REGULATING APPLIANCE.

BY R. E. MAERCKLEIN, D.D.S., MILWAUKEE. READ AT THE TWENTY-SEVENTH ANNUAL MEETING OF THE WISCONSIN STATE DENTAL SOCIETY, JULY 20-22, 1897.

In many cases it would be desirable to hook or fasten some appliance on or near the apex of root of the tooth, but it is impossible to do this without mutilating the gums, as normally the tooth is covered by other tissue. With this appliance, which I am about to

describe, you get practically the same result as with your attachment direct to the root. With this as a hypothesis, it is plain to see what a great advantage you have in regulating cases of this nature.

To explain the method scientifically, it will be necessary for me to dwell a moment upon the subject of levers, on which the theory of this problem is based. For example, if two separate parallel rods are firmly fastened together by a crossbar at one end, they become one object, and if force be applied to the other end it is immaterial on which rod you apply it, as the strain would necessarily be equal on both, it being taken for granted that the appliance is strong enough to sustain the required strain. It is also immaterial with a two-pronged instrument on which prong you apply the force, if the force, resisting point, and double object are in the same straight line. If they are not in the same straight line, or in other words at an angle, the point of attachment to your appliance to your prong must be either a hinge joint or one of no motion, or else your body would tend to rotate or move laterally, thus defeating what you wish to accomplish.

In order to be more clearly understood, I will enter into a slight discussion of the different joints that might be brought into consideration in regulating appliances of this kind. The hinge joint, of which I have already spoken and with which you are all familiar, gives motion in but one direction, so it can be used to great advantage in this connection. On the other hand, the well-known ball and socket joint gives motion in nearly every direction, which very fact, making it so useful in many instances, would prove inefficient if used here. For example, if you have a two-pronged instrument and apply force upon the one prong having a ball and socket joint at the point of attachment, it would naturally follow by rotating this instrument in such a manner as to bring the force, resisting point and double object in one and the same straight line.

Before applying this principle I will give a practical example, so that there will be little chance for vague ideas in regard to the application of this device. Take for instance two or three separate bars an inch or two in length; arrange these in the shape of a cone, and firmly fasten the bars together at the apex. Is it not plain to every one that this pronged body will act just as a solid mass of the same dimensions, providing the strain is not great enough to fracture either?

you get your force another rod of rolled platinized gold wire, fastening it up through the loop with the screw on the end, and lengthening so that it holds the cutting edge stationary, you must throw the apex forward by the simple lengthening of the bar.

AS THE FACULTIES' AND EXAMINERS' DISPUTE LOOKS TO AN OUTSIDER.

BY W. H. WHITE, D.D.S., SILVER CITY, N. M.

The controversy between the National Association of Dental Faculties and the National Association of Dental Examiners presents some features which are very common in the transactions of ordinary humanity. It seems that so long as the Examiners passed rules which forced the student to take more courses of lectures and longer courses of lectures, and thus brought more fees to the colleges, and especially when the five years previous practice ceased to deduct any of the time required to prepare for examination, thus forcing all the dental education of the country to the college mill, the Examiners were a great and glorious institution. But when the Examiners saw fit to supervise the previous preparation of applicants to dental colleges, and thus to curtail the latter's omnivorous instincts, then the Faculties rose up in righteous indignation and demanded to know if they were not "a bigger man than old Grant?"

Now while I have a profound respect for the great knowledge and acquirements of the Dental Faculties, and while I realize the great power for good that rests in their hands, unfortunately it is the experience of humanity that great knowledge and great power do not usually deter a man from following the course of self-interest, even when that course is detrimental to public welfare. It is still more common experience that a public servant attends to public affairs better than a dictator.

The National Association of Dental Faculties is an entirely irresponsible body so far as the ordinary member of the profession is concerned. On the other hand, each member of the National Association of Dental Examiners is responsible to the state board of which he is a member, and this state board is indirectly amenable to the sentiment of the dental practitioners within its borders. The National Association of Dental Examiners is the most representative body connected with the dental profession; it has the legal status, and is the natural mouthpiece of the general practitioners of den-

Put this in practice by applying it in the following manner: Artificially bifurcate the root with a lever, which must be firmly fastened to the crown with a cap or band, this lever to extend as nearly parallel to the root as possible and so far up as the lips will allow. You can then apply the force upon this lever and get practically the same result as you would were it possible to attach your appliance direct to the root.

We have simply bifurcated the root of a tooth artificially, or in other words, added a root which extends up between the lip and the gum tissue. To this we apply our force and get, as before stated, the same result as though we attached to the apex of the root and fastened our appliance directly to the same. It must be remembered, however, that in cases where we do not care to change the position of cutting edge of crown, it becomes necessary to add an appliance which will hold the same stationary. It must also be remembered that you have nearly three times the force with the same amount of power, which is of course due to the gain in leverage by coming nearer to the point of greatest resistance.

Discussion. Dr. R. J. Wenker: Is there any inflammation of the soft tissues under the lip?

Dr. Maercklein: No more than with any other regulating appliance, unless you have sharp edges, and they can be covered with a little chewing-gum.

Dr. R. G. Richter: Is your idea to have this line in a parallel line with the long axis of the tooth, thereby bringing your pressure and moving these two bodies parallel?

Mr. Maercklein: It is not necessary, but the more in a straight line you get it the more you have the exact condition as though it were attached to the roots directly.

Dr. J. J. Wright: Is germansilver rigid enough to hold the strain of such a bar?

Dr. Maercklein: Not unless it is very heavy; a platinum and gold one is better.

Dr. T. M. Welch: How is the power applied in this method?

Dr. Maercklein: According to the number of teeth in place. Get the resisting power from the third, second and first molars. If you wish to hold the cutting edge stationary, fasten the wire from points around those molars, and fasten each forward to catch the cutting edge into a little loop. Then by extending from the point where

Digests.

FINES FOR ILLEGAL PRACTICES. The New York *Sun* of November 17, 1897, noticing the fine of \$150 imposed on Finney, a druggist, for illegally practicing medicine, said: "This is the heaviest fine yet imposed in special sessions for this offense."

In making this statement *The Sun* was misinformed. The heaviest fine imposed since the County Society began to enforce the medical law of 1881 was that of \$500, inflicted on January 9, 1889, in special sessions, upon one Bourquteet, "private physician to the Bey of Tunis," for a first offense. That same court also imposed fines of \$250 upon Brown, August 12, 1887; Strosser, June 4, 1891; Goldsmith, October 31, 1892, and De Samora, December 8, 1892; also fines of \$200 upon Eckardt twice; Kraft, Tochtermann, Montague, Utzsinger, Michael, Morrel, La Roche, St. Leon and Raffel; also fines of \$150 upon Weinstein, Guggenheim, Libertino, Hamacher, Pool, Koehler and Rosa. Thus there have been twenty-three cases in which a fine of \$150 or more has been imposed by that court.

The court of special sessions also imposed on October 4, 1897, prior to Finney's case, a fine of \$150 for the illegal practice of dentistry by one Diaz in the "Boston Dental Parlors," and in so doing expressed approval of the dental law and the judicious manner in which the state dental society sought to have it enforced.

The largest fines inflicted under the dental act have been two of \$500 each upon the notorious Kahn and Jordan, whom the state dental society caused to be convicted in 1896 for unlawfully affixing the letters M. D. to their names.

All of the above fines, except those in the dental cases, were imposed prior to December 15, 1893; and it may therefore be possible that no fine of \$150 has been imposed in special sessions since then.

The last report of counsel published by the county society, that of 1896, shows by a tabulation that since December 15, 1893, five fines of \$250 and one of \$150 have been imposed, but in what court does not appear; however, from what is said of the court of special sessions in the body of that report, and the further fact that *The Sun* presumably derived its statement from some one it supposed was authority, one may fairly assume that those fines were imposed in general sessions.

tistry throughout the country, and it should be fostered and upheld by them until it becomes the court of last appeal in all matters pertaining to dentistry.

While I am one of those who believe that some dental education worth having may be acquired outside the colleges, I realize the paramount influence for good and the absolute necessity of the colleges to the profession; still, I think they will do the profession more good as servants than as masters.

WORRY.—Modern science has brought to light nothing more curiously interesting than the fact that worry will kill, and the way in which it kills is stated to be that worry injures beyond repair certain cells of the brain. The brain being the nutritive center of the body, the other organs become gradually injured, and when some disease of these organs or a combination of them arises death finally ensues. Occasional worrying of the system the brain can cope with, but the iteration and reiteration of an idea of a disquieting sort the cells of the brain are not proof against.—*Pharmaceutical Products*.

TRIUMPH FOR A HYPNOTIST—DR. LYMAN MASTERS A DOUBTING PHYSICIAN.—Dr. Charles Lyman, of Rockford, Ill., a hypnotist of local repute, was invited to give a number of tests before the Northern Illinois Dental Society, which was in session in that city recently. After a number of experiments with subjects, Dr. F. H. Edwards, a well-known physician, stated that he doubted whether the subject was hypnotized. This brought out a challenge from Dr. Lyman to put Dr. Edwards in the same condition, which was accepted. After a struggle of nearly two hours against the subject's will the hypnotist succeeded in mastering the physician and had him following his suggestions as he pleased. The test created a great impression and was the talk of the visiting dentists.—*Chicago Evening Post*.

IS DENTISTRY A NECESSITY IN THE EYES OF THE LAW?—Two cases which have recently come before our notice make us arrive at the conclusion that the services of our profession are not considered a necessity by the legal mind, at least not in all cases. An action at law was tried before the Supreme Court of New York, in which it was decided that filling and regulating the teeth of a minor was not a necessity and that the parent need not be liable. In the case of extraction for the relief of pain, however, the dentist became a necessity and his fee would require to be paid. The other case relates to artificial teeth. Judge Wynne Foulkes heard an action the other day by an Atherton dentist for money due in respect of an artificial set of teeth supplied to a minor, and held that "the contract could not be enforced under the act, artificial teeth not being a necessity." Common sense would have decided that as nature considered teeth a necessity, their substitution after loss would come under the same heading. But common sense and law are frequently at variance. It therefore behooves dentists who perform operations for minors to assure themselves of the consent of the parents and guardians of their young patients.—*Brit. Jour. Dent. Sc.*

It is a curious result of the various amendments of the laws that—dentistry and the practice of medicine being both regulated by chapter 25 of the general laws, and the former being a specialty of the latter—the misdemeanor of unlawful dental practice must be punished by a fine of not less than \$50, and may be punished by a fine of \$500; while the offense of unlicensed medical practice cannot be punished by a fine of more than \$250, and may be punished by as small a fine as the court sees fit to impose, which in one instance was \$10 and in three cases \$25. Thus for purposes of punishment, assuming dentistry to be a specialty of medicine, the part is greater than the whole, Aristotle to the contrary notwithstanding.—W. A. Purrington, in *Medical Record*.

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SURGERY ONE HUNDRED YEARS AGO. By Dr. George Fischer, Germany. As regards dentistry, Germany was far behind France and England, where excellent and intelligent dentists could be found. In 1728 the Parisian dentist Fauchard created an epoch with his "Chirurgie Dentiste," the first complete scientific work on dentistry published. This work formed the basis for all the succeeding books issued. Among the better-known dentists were Berdmore ("Treatise," 1770) and Spence of London, and especially Jourdain of Paris. One of the most important works relating to dental anatomy as well as surgery was written by J. Hunter ("Natural History of the Human Teeth, Explaining their Structure, Use, Formation, Growth and Diseases," 1771). The pain in a carious tooth began when the air touched the bare nerve. Ever of an inflammatory nature, it was not directly dependent upon caries, but due to secondary caries, a disordered stomach, etc., and was so excruciating because the inflamed portions could not spread nor give like the panaritium. To prevent the advancement of caries by draughts of air, the cavity of the tooth had to be filled with gold or lead, or the decayed tooth was extracted, cleansed by boiling and then replaced, whereupon it again grew fast to the socket. Hunter was particularly successful in this mode of procedure, which he based upon his experiments. Having removed the spur of a cock and replaced it in the bird's crest, it again adhered; the human testicle having been cut out and returned to its place, likewise grew. If a sound tooth was knocked out by an accident, it was at once put back into the socket. Also the teeth taken from cadavers and set

again remained intact for many years; they were fastened to a neighbor tooth by a thread. In this connection Littsom, a native of the West Indies who had freed his slaves and thereby lost much of his property, called attention to the transference of syphilis, which he had not observed to be the case when inserting artificial teeth (1787). These were constructed from hippopotamus teeth (Nuck, 1714) or of ivory, and so skillful was the manufacturer that he made whole rows, even entire sets of teeth. When a patient refused to have his decayed tooth extracted, the nerve was killed with a heated fine knitting-needle or with mineral acids or caustic alkalies. The prejudice that a tooth must not be drawn during pregnancy was disputed by the Vienna dentist Serre. In case of an ulcerated tooth the only remedy was to remove it; but not until the inflammation had subsided so as to prevent its spreading. With painful and difficult eruption of teeth Hunter, as Pare had done, advised the cutting of infants' gums, but it was essential that the knife or lancet pierced through to the tooth, otherwise the operation was useless; the scar did not hinder its exit. The Erlangen professor, Isenflammer, contested this idea and therefore opposed this little operation. B. Bell, who early employed the cross incision, was of Hunter's opinion; also Richter, who had very accurately described the process of teething. Both recommended as a means of cleansing the teeth to rinse the mouth with lukewarm water after each meal, which method had already been advised by the French dentist, Guillemeau, in 1706, and wiping off the teeth with a sponge. Theden thought it necessary to clean the teeth also at night, so as to remove all particles of food. In treating sound teeth Richter discarded all powders, brushes and toothpicks, which ought never to be too pointed, nor made of soft wood, nor of metal, nor be made from quills. Even during his time Guillemeau considered it dangerous for the preservation of the teeth to drink beverages too hot or too cold; on the other hand, he thought well-baked bread, mutton and chicken conducive to good teeth; fought against the use of golden and silver needles as toothpicks and permitted only those of quills. Dirty teeth required the application of powder prepared from cream of tartar, chalk and cinchona, with a brush, used on the lower jaw in an inverted position and vice versa on the upper jaw. Tartar was removed with instruments; for filling the teeth zinc was also used, besides lead and

gold. Hirsch of Jena advocated the use of tinfoil in 1796. According to Richter, the remedies for toothache depended upon the origin of the same. When inflammatory, caused by caries, leeches and poultices were applied; if rheumatic, tincture of cantharides, cajeput oil, camphor and electricity were prescribed; if caused by a disordered stomach, emetics of cream of tartar; in case the origin was not known, extract of poppy and the above anti-rheumatic remedies were used. The most common instruments for pulling the teeth, which was done toward the side on which the continuation of the socket was the thinnest, were the pelican, the English key and dental elevator.

The suppuration and the operation for the opening of the antrum of Highmore were known. In 1675 Molinetti first opened the antrum directly through the cheek by means of a cross incision and by trephining, while Meibom in 1718 first laid the socket bare by extracting the teeth implicated. To this method Cowper and Drake added that of puncturing the alveolar processes. After the Bremen physician, Runge, had compiled the first work on the diseases of the antrum (1750), the French surgeons Bordenave, Lamorier and Jourdain gave their special attention to this operation and published their writings in the fourth volume of the *Memoirs of the Academie*. Bordenave recommended Meibom's method and extracted preferably the third molar, because its alveolus was the thinnest, therefore the easiest to perforate. He at once caused a large opening, which he kept from closing by inserting a silver tube. This procedure was opposed by Lamorier, because often a sound tooth had to be sacrificed, and instead trephined above the third molar and below the cheek-bone, the most prominent part of the antrum. Jourdain, however, deemed it useless as a rule to open the antrum in this way; he sought to find the connection with the nose, in order to free the closed passage and through this make his injections. This method was much too difficult and often impossible, consequently of no use. Lastly, Gooch is mentioned, who bored through the hard palate into the antrum, taking for granted that the same had been pushed forward by the pus. Most of the surgeons chose either Meibom's or Lamorier's method. B. Bell employed a curved trocar, in order to make a puncture from the alveolus; Desault opened from the mouth the lower portion of the fossa canina where the bone was the thinnest and where the operation and

the after-treatment were most easily accomplished. These punctures and trephining of the anterior wall are to be considered as the starting-point for the resection of the upper jaw.

In a similar manner was treated the suppuration of the frontal sinus, which Richter saw break through into the skull cavity. Either the interior wall was trephined or injections were made into the nose as soon as the pus had found its way there, or if the outer wall was already decayed, the too small opening was enlarged, which, however, could remain fistulous for a long time. Bilguer was once very successful in taking a bullet out of the frontal sinus, and Marechal related the case of a wound in which the brain matter was mistaken for mucus and pus.—*Jour. Am. Med. Assn., Nov. 1897.*

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BLEACHING DEVITALIZED TEETH WITH PYROZONE.

By J. P. Parker, D.D.S., Santa Cruz, Cal. Read at Pacific Coast Dental Congress, July, 1897. The time consumed and the inconvenience to the patient in bleaching, as a rule, are less than in crowning, and the tooth and root are made more aseptic, thus improving the sanitary conditions of the mouth and thereby lessening the chances of pericemental inflammation. In bleaching with pyrozone we remove septic matter that we would not if we were only crowning.

I begin the process of bleaching by first placing the rubber as closely as possible around three or more teeth; if there is a cavity of decay excavate that, then open into the pulp-canal, and with a spray of a 25-per-cent solution of pyrozone reach all exposed points inside and out, following with blasts from the hot-air syringe. When it is difficult to reach far into the root with the spray I employ cotton to carry pyrozone to the end of the root. One need not fear any serious results in so doing; and yet, if there is no necessity for so doing, it is well to avoid crowding it through the apical foramen. After continuing this treatment from twenty to forty minutes close up the tooth, and in forty-eight hours it will present a great change, usually becoming as white as the others. However, if it does not, repeat the treatment, and it will be a rare case that will need a third application.

I find it very difficult to determine at the first sitting, and while operating, to what extent the pyrozone has affected the tooth, some cases being much more stubborn than others, and in some it is hard

to see any improvement at the time of the operation, but the next day may bring great changes.

There are two kinds of stain that I have found very hard to remove, and I doubt if pyrozone will effect a satisfactory result. The first is a mineral stain, and the second is occasioned by the tooth having been stained with oil of cassia or cinnamon.

One writer speaks of pyrozone as injurious to the vital teeth adjoining the one to be bleached, and suggests covering them with wax, but I never have seen any necessity for such a precaution; he also advises cleansing the teeth with alcohol before beginning to bleach, but I see no necessity for that. Another writer speaks of pyrozone 25-per-cent as a CAUSTIC, spelled with capitals, and yet it is the most yielding of all caustics, as it does not destroy tissue. True it burns for a time, but the tissue will live, and in a few hours be as though it had never been burned. This writer also speaks of continuing the operation for three hours in stubborn cases, but I see no necessity for it.

Discussion. Dr. A. F. Merriman, Jr.: I had an experience recently that pleased me very much. The patient had met with an accident some twenty-five years ago. She received a blow upon the central and lateral incisors which I judge was the indirect cause of the discolored teeth. I found it necessary to crown the central, but the lateral I bleached to my satisfaction. After the removal of the debris I used ammonia, and instead of the 25 I employed the 5-per-cent pyrozone to my perfect satisfaction, for I found I had a good color. The tooth had been discolored twenty-five years. I have recently seen it and there is no rediscoloration. I think you will find the 5-per-cent solution used with the hot-air blast is as efficient as the 25-per-cent and much more easily handled.

Dr. Platt: I met with the same experience not long ago. I bleached the tooth and got it too white, but it has now pretty nearly reached its normal color. I think it acts very much as a natural inlay would. You may put in an inlay and have it too light at first, but in a few days it will assume the color of the adjoining teeth. Why it does so I don't know. I think that principle applies to a tooth that has been bleached very thoroughly, dried out perhaps. I would like to say also that in the use of pyrozone, 25-per-cent, the cataphoric procedure is of very great assistance. I have in teeth that were very much discolored taken out

the putrescent pulp and put an amalgam filling in, and in forty-five minutes to an hour and a half—at the longest two hours—I have bleached those teeth white enough for every purpose, so they could not be very readily detected from the adjoining teeth. In one case I bleached a lateral incisor that was very badly discolored in thirty-five minutes with the cataphoric apparatus and a 25-per-cent solution of pyrozone. It was as near normal as you could possibly expect a devitalized tooth to become. The use of the cataphoric apparatus with pyrozone greatly expedites the procedure. So far as I can find it is without any pain at all where the tooth is devitalized. Two or three patients have complained of a tingling sensation where the negative pole was placed, but no pain. It hastens the work very materially, and does not, so far as I can determine, do any injury to the teeth.—*Pacific Stom. Gazette, Nov. 1897.*

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CARBOLIC ACID GANGRENE. Czerny (*Munch. Med. Woch.* April 20, 1897) observed that, whereas some twenty-five years ago there were numerous records of carbolic intoxication, yet even in that period the occurrence of gangrene was rarely reported. After referring to some recorded cases, Czerny observes that hardly a semester passes in his clinic without a case of carbolic acid gangrene presenting itself, and he warns his students against the use of watery solutions of this agent. He gives details of three cases recently admitted to his clinic. In all the cases the carbolic acid solution was applied to a wound of the finger. Gangrene supervened, and amputation became necessary. This gangrene is of the dry kind. The anesthetic action of carbolic acid induces the patient to leave the dressing on. The part first becomes grayish-white and eventually black, without any sensation of pain. Circulatory disturbances caused by firm bandaging, inflammation or a severe injury predispose to it. The above named patients were in robust health, and the injuries were not such as to induce gangrene by themselves. In two of the cases a three-per-cent solution of carbolic acid was applied, but it was kept on for several days. The duration of the application is more important than the concentration. The author concludes that since, with any solution of carbolic acid, gangrene may under certain circumstances develop, this agent should be altogether avoided as a dressing and other antiseptic solution used.—*British Medical Journal, May 22, 1897.*

SALIVARY CALCULUS IN THE PAROTID DUCT CAUSING SYMPTOMS SIMULATING ALVEOLAR ABSCESS. By T. E. Constant, L.D.S., Eng. Miss M., aged about 50 years, came to me "to have a tooth out." The left cheek was obviously swollen and the swelling had commenced three days previously. The cheek was both painful and tender, but the skin, although tense, was not reddened. The swelling was most prominent in the center of the cheek. Pressure over the region of the left parotid caused pain. The patient was very nervous, and examination of the mouth in consequence somewhat difficult. The patient said the trouble "commenced with pain in the last tooth of the upper," viz, the left upper second molar. When that tooth was gently tapped she complained of pain, although it was apparently a sound tooth. She said it had been very painful in eating during the last three days. Careful examination, however, enabled me to assure myself that the swelling in the cheek was not connected with either the upper or the lower jaw, and I noticed a greyish appearance at the most prominent part of the swelling in the mucous surface of the cheek. At first I thought it was a commencing slough, but subsequently found it to be due to something white showing through the mucous membrane. With some difficulty I passed a probe into the parotid duct and was able to dislodge a small calculus—about the size of a one grain cocain tabloid and very much of that shape. I saw the patient two days later, when the swelling had subsided, and the mouth "felt perfectly comfortable."—*Jour. Brit. Dent. Assn.*, Nov. 1897.

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PULPLESS TEETH AND THE TREATMENT OF ROOTS FOR CROWNING. By D. D. Smith, D.D.S., Germantown, Pa. Read before New Jersey State Dental Society. Perhaps no one process in dentistry has developed more methods, or elicited more discussion than that embraced under the head of "root filling." So-called "treated teeth" are commonly regarded as the unknown quantity in dental equations, and a vague uncertainty and a dread of consequences seems to attach to them. That such uncertainties are not a necessary concomitant in the treatment of pulpless teeth and roots, but that such teeth are subject to well defined physiological law, although their condition may be in a degree pathological, it is hoped this paper and the discussions that may arise from it will tend to establish, and that ere long this subject may be lifted out of the

domain of uncertainty and assume a position of certainty in prognosis and assured results in practice.

To bring this matter clearly into view, it seems necessary to briefly review some microscopic characteristics of the teeth. The structures which concern us most are the dentin, cementum, pericementum and pulp. A clear apprehension of the nature and office of these structures, and of their relations to each other, seems indispensable to the intelligent and comprehensive treatment of pulpless teeth and roots.

For the purposes of this discussion, it matters little how, when or by what special organ they are formed or deposited. Our inquiry is, what is the office of each, and what are the relations of the one to the other in this office work in the fully formed and erupted tooth?

The cementum, the external osseous covering of the root in young life, is made up essentially of true bone structure, nourished and supported by its pericemental membrane, precisely as bone tissue is nourished and supported in other situations. This most vascular of the osseous tissues of the teeth is distributed over their roots for the evident purpose of giving them intimate and enduring attachment to the alveolus. It should be noted that this cemental covering varies considerable both in density and thickness at different periods of life, and that thus its true function is often perverted and its office of sustaining the tooth in the alveolus materially interfered with. Neither the pericementum nor the cementum contributes to the nourishment or sustenance of the dentin, unless it be by secondary influences and in a most indirect manner. In intimate association with the dentin of the root and in communication with the pulp, they are yet perfectly independent of both, in so far as sustenance and nerve supply are concerned, as they derive both of these forces from other and independent sources. Whilst there may be traced in some instances anastomotic relations between the tubuli of the dentin and the vascular portions of the cementum, this relation is not sufficiently intimate even in the thicker portions of the cementum to warrant the belief that any true nourishment is imparted to the cementum by the pulp acting through the medium of the dentin. On the other hand there are strong indications that whatever influence the pulp exerts upon the cementum is in the direction of calcific deposits, thus tending to deprive it of bone characteristics and convert it into dentin. It has been intimated that the pulp may promote vascularity in the cementum, but my belief is

that this does not, and in the nature of their relations cannot take place. That the calcific changes which occur in the dentin of the crown, and in the enamel in young teeth, are due to the pulp, needs no demonstration, as the retrograde metamorphosis in these tissues, which results from the death of the pulp, is sufficient proof of the fact that it is their only source of sensation and sustenance.

It is then the function of the pulp in the erupted tooth to recalcify, reconstruct, nourish and protect the dentin and enamel in the crown; and, if in the crown, why not in the dentin of the root? That it does this is abundantly shown in the hardening of the dentin in this part of the tooth; in the extension of the calcifying process into the territory of the cementum, and the conversion of it into more or less perfect dentin; in the occasional deposits of enamel found in the cementum; and in the withdrawal of the alveolar process from about the roots of many teeth with living pulps, after middle adult life.

It is not the function of the pericementum to calcify or in any other way impair the vascularity of the cementum; this tendency or influence is derived from the pulp alone. Demonstrations of this fact are found in cases of devitalization of pulps in young teeth, where the cementum often receives accretions in the form of exostosis; for it is a matter of observation that the roots of young teeth which have been any considerable time devitalized are exostosed to a greater or less extent. This form of exostosis taken on through the agency of the pericementum alone, seldom or never occasions pain in the teeth, and this certainly points to unimpaired vitality and nerve supply in the cementum after devitalization of the pulp, and to the pericementum as the caretaker of the cementum; and, consequently, to the belief that this is its true and only function. It is thus apparent that a tooth is endowed with two separate and distinct sources of life, the one derived from the pericementum for the control of the cementum in all its substance, and the other the pulp, which governs all of the enamel and dentin and their connective tissue, and this important fact must be remembered in all our studies relating to pulpless teeth and roots, if a true basis of treatment for such teeth is ever to be reached.

It is of little consequence what filling material may be introduced into the root-canal if the devitalized dentin and its contents become repellant to the cementum and the pericementum; there remains in such case little comfort or usefulness to the tooth.

Dr. Bodecker, speaking of the appearance of dead dentin under a power of twelve hundred diameters, says: "The dentinal fibers appear shriveled up to rows of minute granules not always in the center of the canaliculus, but frequently quite near to one of its walls. The basis-substance shows a rather indistinct dark violet reticulum with numerous interruptions. The facts here described suffice in my judgment to determine the nature of the reticulum pervading the whole of the dentin; it is of necessity the living matter which is plainly marked in living, and shriveled and reduced to rows of granules in dead teeth."

Reviewing the conditions presented after the devitalization of the pulp, in the light of the microscopical researches here presented, we have first, the pulp cavity and canal in the root, with their contents of pulp substance and linings of cavities; and second, the contents of the dentinal tubuli, the connective tissue, basis-substance or reticulum and the matter of the interzonal layer. This is now all dead matter, and subject to change and decay as is dead animal tissue wherever found. The one source of vitality and nourishment for all the interior structures of the tooth having been destroyed, there remains only that life which retains the tooth within the alveolus, viz., the cementum and the pericementum. What will best conserve the normal activity of the living cementum in its new relations and assist it to remain a living issue, in harmonious relation with dead or at best mummified dentin? Surely not any particular kind of filling material which may be introduced into the root-canal, but rather some form of treatment which shall place beyond the reach of putrefaction the structures subject, with the death of the pulp, to decomposition and decay. Disturbances to pulpless teeth come from causes within themselves, and no filling material alone will ever shut them out. Let us then in dealing with such teeth place the emphasis where it should be placed—upon treatment, and not upon filling materials or methods of applying them.

Efforts in common practice point the first step in treatment, viz., through removal of all pulp tissue, whether it be freshly devitalized, or whether it be in a state of decay and putrescence; and this not only from the pulp cavity but from all canals as well. This of itself is not always an easy operation, as no inconsiderable difficulties frequently present to gaining access through the cavity of decay, even to parts of the pulp cavity, and much more to many

small tortuous and inaccessible roots; still it would be difficult to emphasize too strongly the importance of removing all of the substance of the pulp from the pulp cavity and from the root-canals.

No expense of time or patience should be counted too great for its successful accomplishment. Neither should it be considered a sacrifice to remove strong and good dentin where necessary to gain free access to the root-canals. One has said, "cut until entrance can be gained on straight lines," and this, in a general way, is good advice. Not only should the crown be opened up to admit of successful manipulations, but the pulp cavity and the canals should be enlarged and reshaped until they will admit of access to all parts.

In this operation is necessitated the removal of the lining membrane of the cavities, the reticulum or basis-substance and inter-tubular matter which comes away with the removal of the dentin. This should be effected without weakening the crown or root, or doing violence to any vital part of the tooth which remains. The greatest care should be exercised that no encroachment be made upon the cementum, either by too free removal of dentin in its longitudinal aspect, or by piercing it at any point with drill or reamer.

Opening into or through the cementum along the side of the root is a most unfortunate accident and establishes an unfavorable prognosis. A natural opening of considerable size at the apical end of a root may be of no special significance, if such opening be properly closed in filling, but a drilled opening of equal size and similar location is by no means so easy of treatment and may prove a great detriment to the root.

The roots requiring greatest care in treatment are: first, small superior laterals; second, first superior bicuspid; third, the buccal roots of superior molars and the mesial roots of lower molars; and fourth, the roots of inferior centrals and laterals. Violence done to a small, irregular or curved root, by piercing the cementum, seems often to be provocative of more trouble than the opening through a large and well formed root, and yet it is frequently found that where the danger of piercing the root from enlargement of the canal is greatest, the necessity for entrance to the canal for the complete removal of the pulp is the more imperative; and thus is presented the importance of patient and skillful manipulation; and nowhere in dental operations is greater skill and good judgment required than in opening and cleansing many root-canals.

Assuming now that the mass of pulp material in the pulp cavity and root-canals has all been removed, let us inquire if anything further can or should be done to insure the comfort of the root before filling or crowning.

The only treatment which has proved uniformly satisfactory in my hands is the creosote treatment. Pure beechwood creosote is a medicament of unfailing utility and permanency when applied within recently devitalized teeth and roots. It is safe, non-irritating and effectual. It is the one material which, when used after cleansing of the canals, neutralizes and renders harmless, even in the young and imperfectly calcified teeth, any decomposition arising from the basis-substance, intertubular matter, or from shreds of pulp tissue in portions of absolutely inaccessible pulp-canals. It places and keeps the devitalized dentin of the roots in harmonious relation with the living cementum which surrounds it, retaining the creosote odor, and consequently its control over decaying matter indefinitely.

Applied on a few fibres of raw cotton (absorbent cotton should never be used in medicinally dressing a tooth or root), twisted into a thread of convenient size, immediately after the removal of a freshly devitalized pulp, it is soothing and most beneficial in its action on the root. Such dressing should be kept sealed in the root from twenty-four to forty-eight hours, and for a longer time in young unconsolidated or imperfectly calcified teeth, that the influence of the creosote may permeate to all parts of the dentin.

It should be carefully noted that while it may be freely and universally applied within a root from which an odorless pulp has been removed, great care and caution should be exercised in applying it to roots containing putrescent matter. A soothing, quieting, beneficial application in the one case, it becomes a violent instigator of periosteal inflammation in the other. To this I apprehend is largely due the disuse of creosote in the treatment of roots, especially putrescent roots, and yet the creosote treatment is of even greater benefit to the putrescent root than to the odorless one.

In the treatment of teeth and roots with putrescent pulps, the effort should be made first to remove all putrescent matter and disinfect with creosote. In this operation, only plain nerve instruments or broaches should be used. No cotton should be attached to the instrument in an effort to facilitate cleansing. After cleansing the root and applying the creosote carefully, the root should be left

entirely open for a time. If any dressing be used, it should be merely a pledget of cotton very loosely applied in the cavity of the tooth, simply to protect it from food and extraneous matter. In twenty-four to forty-eight hours the operation of cleansing the root with creosote on plain instruments can be repeated, when if there be no signs of periosteal inflammation, the root may be more thoroughly cleansed and deodorized by using the creosote on a few fibres of cotton rolled on the instrument, and afterwards by introducing very loosely into the root a thread of cotton dipped in creosote.

The main cavity should again be very loosely closed with cotton, the gum over the root touched with iodin, and the tooth allowed to remain quiet until another sitting, when after recleansing the root, it can probably be stopped tightly with the cotton dressings saturated in creosote. When the tooth will bear such dressing for a day or two, and the cotton comes from the root having the odor of creosote only, the tooth or root is in the best possible condition for filling or crowning, and either operation may be performed without apprehension of aftertrouble.

If the theory of two sources of life to the tooth has been successfully established, and I believe it has, it stamps at once as fallacious and untenable the impression so generally prevalent in the profession, that odors and putrescent conditions found within treated teeth come from sources without the tooth, or that they result from the use of special filling materials. It is indisputable that all odors arising from the cavities of devitalized teeth come from decomposition of the matter within the tooth itself. Arising more commonly from some pulp remains, they may and do have their origin in the decomposition of the basis-substance, intertubular and other matter of the dentin, especially in young teeth subject to destruction of the pulp, disorganization and decay.

While the title of this paper would readily admit of closing at this point, it would nevertheless seem incomplete without some reference to materials and methods for root filling. As has been stated, the emphasis should in all cases be placed upon treatment for roots rather than upon methods or materials for filling them, and yet there is a judicious discretion to be exercised in the choice and use of materials. Certain of the materials in general use are practically if not positively inert and can meet no requirement of a root filling except that of closing the cavity; these

are the metals gold, tin, amalgam and lead, wax, and the different preparations of gutta-percha, all of which have for a considerable time been excluded from our list of desirable filling materials for roots. Of the materials more or less antiseptic and medicinal in their action we have medicated wooden plugs, medicated cotton, chloro-percha, the phosphates and the oxychlorids. A wooden plug saturated in creosote or chloro-percha may, in favorable conditions and places, make a desirable filling in carefully treated roots, but for plain accessible roots which can be kept dry whilst filling, the preference is given to the oxychlorids carried to place on cotton. For small roots difficult of access, preference is given to fibres of raw cotton, twisted into a thread of convenient size, saturated in creosote and carefully packed in the canal. For root fillings in conjunction with posts, for retaining any form of crown, the decided preference is given to the phosphates.—*Items of Interest, Oct. 1897.*

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LOSS OF NERVOUS POWER, RESULTING FROM A CARIOUS TOOTH. By J. H. Edward, L.D.S. The vis nervosa, or power of the spinal nervous system, is not electricity in any of its known forms or modifications. I therefore venture the hypothesis, that there exists some modification or differences in the electricity (vis nervosa) of different animals. My reasons for doing so are founded on an accidental discovery I made a few years since whilst I was taking shocks from a series of powerful magnets (electromagnetism). These shocks affected me in a very different manner from those taken from either a cylindrical or a plate electrical machine. From the latter there is experienced, immediately on completing the electric circle by the hand, a transmission of the fluid through the whole range of the spinal nervous system, whilst the shocks from the magnets were felt only from the fingers to the elbow-joints. So that after repeatedly verifying the accuracy of these observations, the conclusion appeared to warrant the supposition that, however similar the phenomena of electricity and electromagnetism, they were not exactly identical, and having reflected on the many anomalies of the nervous system, showing such marked difference in health and disease, I am disposed to think that the power (vis nervosa) of the spinal nervous system is not electricity in any of its known forms or modifications, but that this vis nervosa is something *sui generis*, and therefore cannot be regarded as iden-

tical with either electricity or galvanism, or with electro-thermo-magnetism. The reflex action of the nervous system, so ably elucidated by Marshall Hall, seems to favor such an inference, and to warrant the supposition that, whatever may be the peculiar nature or properties of the vis nervosa, it is subject to modification in different diseases, according to the proximate cause of the primary disturbing influences—by the kind of tissues or organs involved, and by the peculiar idiosyncrasy of individuals. For how otherwise can we account for so many sympathetic disturbances, as, for instance, in ordinary caries of a tooth? The neuralgic pains may affect the ears in one person, the eyes of another, and in the third there may be violent throbbing of the arteries, with occasional intense suffering along the whole course of the maxillary branch of the fifth pair of nerves.

As an example of some remarkable disturbances from the presence of a carious tooth, and its irritation of surrounding tissues, I may cite the following case: A young lady was brought in a carriage to my residence to have her mouth examined. On being removed, she was supported by a lady on one side and a maid-servant on the other, and her entire muscular system seemed paralysed. Her legs trailed on the ground like useless appendages. Her arms, when raised, fell powerless immediately when unsupported, and even the muscles of the tongue were paralysed; and in her efforts to speak this important organ remained in a quiescent state. On examining the mouth I perceived a *dens sapientia* of the mandible very carious, and deeply imbedded in the temporal muscle, just below the ridge of the coronoid process, in which locality there was extensive inflammation. I suggested the removal of the latter tooth, and though I had anticipated some advantage from the operation, the actual results astonished me. She instantly obtained the free motion of her tongue, which she immediately used to communicate an important fact, viz., "that ever since the time the tooth I had extracted had been making its way through the gum, she could date the gradual loss of power over her limbs, etc." I saw her about a month afterwards; she could use her hand and arm. Since then I have not seen what further progress she has made.

In this case we had palpable proof that the phenomena could only be explained by assuming that the local irritation (shown by the great vascularity of the part) had, in the first instance, affected the

maxillary branch of the fifth nerve, implicating the trunk of the nerve itself, and ultimately communicating the disturbed condition by reflex action to the spinal system. From this and similar cases I think that there must be some modification in the vis nervosa, depending on some predisposition, local or general, or from some peculiar constitutional condition, for if such were not the case why does not every tooth similarly affected produce, in all cases, uniformly similar consequences, in obedience to the law—like causes produce like effects?—*Jour. Brit. Dent. Assn., Dec. 1897.*

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PROSTHESIS OF ENTIRE DENTURES WITH COUNTER-SUNK-PIN TEETH ON THE VULCANITE BASE. By Allison R. Lawshe, D.D.S., Trenton, N. J. For the purpose of imitating the natural organs and obtaining the most useful, comfortable, and artistic denture, the countersunk-pin teeth are, perhaps, as superior to plain teeth as are the latter to the sectional block, for the reason that, when selected with due regard to the temperament of the individual and mounted upon a properly constructed artificial base, they present to the tongue organs similar in form to those of the natural denture, and, with the assistance of the palatal gum-festoons and rugæ, materially aid the tongue and cheeks in manipulating the food, as also in deglutition and enunciation. Besides, if the lingual as well as the labial surfaces of both the upper and lower vulcanite plates be faced with pink rubber, exposure of artificiality will be avoided.

My method of procedure is as follows: After obtaining an accurate model of the mouth from a plaster impression, and the bite by the How method, and after setting up the case in the articulator, I coat the model with gum-tragacanth mucilage and cover it with a sheet of No. 3 tin-foil, rubbed neatly to place with a ball of cotton under the finger, and, with a thin sheet of wax pressed carefully to place to avoid forming places of extreme thinness, as over the air-chamber and rugæ, I form the temporary base-plate and proceed to set up the teeth with especial care to attain a natural-looking arrangement. This accomplished, the wax forming the gums may be artistically modeled and carved with a small vulcanite scraper, and the festoons formed by Dr. M. L. Fay's easy yet effective method, fully described in the December, 1896, number of the DENTAL DIGEST, which is to arrange a waxed, closely woven

cotton string about the necks of the teeth with a suitable instrument, uniting the string and wax with a spatula and smoothing the case with a fine blow-pipe flame; the string to be removed with the wax when the case is ready to pack. With the countersunk-pin teeth I employ this expedient with pleasing results on the lingual as well as labial and buccal surfaces; moreover, in a similar manner I form the rugæ and the rim of the plate as well, by pressing short lengths of the string into the wax base-plate in imitation of the natural prominences. The size of the string forming the gum-festoons and rugæ is about No. 20 of the standard American gauge; for the rim about No. 15.

Having the case now articulated, waxed, carved and festooned, and the rugæ and rim formed, it is to be smoothed with a fine blow-pipe flame, held under cold water a moment to chill the wax and soak the model, and invested in the shallow half of the flask, making the line of division of the two halves come at the rim of the plate.

After the investment has hardened, a strip of No. 3 tin-foil is lightly pressed against the labial wax and faces of the teeth with a ball of cotton, and trimmed about the necks of the teeth with a sharp lancet or knife-blade, removed, flattened and laid upon a piece of heavy foil (I use No. 30), and the pattern marked out with a pointed instrument, but cut with a pair of shears, and a number of slits, extending about half way through it, made from its lower edge, to prevent folding or crimping of the foil when it is pressed and burnished into position. After adjusting it to place, the foil having been warmed to facilitate that operation, it is lightly indented over its entire surface with a small plugger-point in the engine-mallet, the mallet being set to make a very light blow. On the linguo-palatal surface I use a sheet of No. 3 foil and trim it about the necks of the teeth after pressing to place.

When the case is ready to pack the flask is heated in boiling water until it is certain the wax is softened sufficiently to offer not the slightest resistance to the separation of the two halves of the flask, when it is removed, separated and as much as possible of the soft wax picked and wiped out, the remainder being washed out with boiling water. The teeth and foil are now freed from water with bibulous paper and the air-bulb, and finally washed with alcohol and dried before packing of the rubber is commenced.

I use red or black rubber for the palatal surface and countersinks, which latter should, in packing, be very carefully filled with small pieces, and I form the labial and linguo-palatal surfaces of the Walker granular gum facing.

Of course a considerable surplus of rubber should always be avoided, but it is particularly necessary to beware of a large excess when using the granular gum facing, because when that excess is squeezed out through the vents the particles on which the granular appearance depends will be elongated and the imitation of the natural gum lessened. I ascertain when I have the proper quantity of rubber by pressing the two halves of the flask together, and do so without tearing the tin-foil covering of the model by painting it with liquid soap, the soap being washed away before the flask is bolted. The rubber is vulcanized $1\frac{1}{2}$ hour at a temperature of 310° F.

The finishing of this denture is very simple. After the flask is cooled until there is no warmth left in the plaster investment, the plate is removed and washed, and heavy tin-foil covering the labial and buccal gums pulled off, and the tin-foil removed by immersion in dilute nitric acid, when it is ready, after washing off the acid and drying, to have excess of rubber removed, gum-festoons trimmed with sharp chisels, and finally polished with a stiff brush-wheel charged with powdered pumice. In making lower dentures granular gum is placed on lingual as well as labial and buccal surfaces.

Concerning the subject of strength there can be no question. The countersunk-pin teeth are supported not alone by pins, but also by the walls of vulcanite around the necks of that filling the countersinks.

Another distinct advantage which the countersunk-pin teeth have over the sectional block and plain teeth is, the anterior and posterior teeth are made in different molds, so it is very easy to select molars and bicuspid large enough to make the denture which they go to form a masticatory apparatus in fact as well as in intention. But the manufacturers can still further improve these teeth by making the cuspids about two shades darker than the other members of the set.—*Dental Cosmos*, Dec. 1897.

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PHYSIOLOGIC PSYCHOLOGY OF SMELLING. It is a fact of some interest that while the special senses of vision and hearing have furnished some of the most striking acquisitions of modern physiology, the sense of smell has been left comparatively unstudied

by investigators. The reason for this is not difficult to surmise; its origin has no mechanical peripheral apparatus that can bring its study into the domain of physics, nor do the variations of olfaction also follow physical laws like those of color or tone. The problems of its study fall therefore more into the domain of pure psychologic psychology, and the practical difficulties have been so great that few have attempted their solution. The close associations of the sense of smell with those of taste and general sensation, its easy sophistication and common, and indeed almost universal, impairment among civilized people, have added to the embarrassment and aided to discourage physiologic experimentation in this direction.

Within a very recent period it has been commonly taught that odors simultaneously sensed did not form a mixed odor, but were appreciated separately and consecutively. The mutual relations of odors and their shadings and graduations into each other have not been adequately marked, and the whole subject has been heretofore in a comparatively inchoate and unstudied condition. The ambitious but not especially scientific attempt of Piesse to establish a gamut of odors is of course well known, but has not been taken seriously, and as will be seen, recent investigation has shown that odor combinations follow more the laws of color than those of the tone accords. Thus it has been proved that mixtures of certain odors give rise to new and simple odors, though this was not recognized as an universal law. Zwaardemaker in a memoir published within the last three years has attempted to classify odors, and has made a series of nine classes within some one of which he thinks any odor can be included. Combinations of odors he holds can be resolved into the elements belonging to these separate classes; when the sensation is sufficiently fatigued for one of these another is appreciated, and so on. In some cases he holds that odors do not blend but can be sensed at will by the experimenter.

One of the latest and most satisfactory studies of this subject is that of Nagel, in which he attempted to test compound odors without unduly bringing in the elements of fatigue to complicate the question. He criticizes the previous works on the subject and discusses at length Zwaardemaker's views, but does not offer any elaborated classification of his own, nor does he appear to have been satisfied himself as to what are the simple elementary odors, a posi-

tion which, considering the difficulties and necessarily more or less subjective nature of the study, is very judicious.

The conclusions he does arrive at are that any two odors may combine to form what is, at least for the moment, a new simple odor, the permanency of the latter being dependent on the fatigue of the organ for the components. The new smell is lasting according as this fatigability for the original elements is equal or nearly so. With more than two components the conditions for permanency are improved. The compound odor has a resemblance, but not an identity with its components. A mixture thus made, though previously unknown to the observer, can be readily recognized as such when at least one of its component elements is previously known, and the more readily when the olfactory organ becomes fatigued so as to render any one of them more prominent than the others. Continued observation will therefore detect the odor as a mixture, if this was not possible at the first. If this is still difficult, if the fatigue for all the elements is still so nearly alike as to keep up the impression of a simple odor, special arrangements may have to be made to detect them, such as prior partial fatigue of the organ or Passy's method of successive dilutions.

On the whole the analogies of odor combinations are rather with those of colors than with those of sounds, according to Nagel's observations, which as the latest and apparently the best conceived method of study in this special line, may be taken as giving the latest scientific facts and views upon the subject. He does not, however, find the analogy quite complete in finding complementary odors that absolutely extinguish each other, though he finds several instances of close approach to this.

The human sense of smell is probably only an imperfect relic of what it once was in the earlier stages of evolution, but it still has its practical value, and whatever aids to complete our understanding of its physiology is a welcome acquisition. At present much is still obscure, and the field is yet an open one for further research.—*Jour. Am. Med. Assn., Jan. 1898.*

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NEW METHOD OF CASTING METAL DIES. By Dr. Wm. H. Steele, Forest City, Iowa. We have all been there and know the difficulties to be overcome in order to obtain a perfect metal die of a badly undercut, rough model; cores, sectional flasks, etc., are

all good as far as they go, but fall far short of being a universal success. I have been experimenting for several years in order to find something better, and this method I present you as the result of my experiments; it does away with all the dirt and disagreeable odor of the sand process, and a perfect metal die can be easily cast from the most difficult case. The dies are sharp, smooth and perfect, and several can be cast from the same mold if desired.

Materials for the Work. A good smooth plaster model, a jar of paste, fine Spanish whiting, fine powdered chalk, a medium stiff flat brush for paste, a very soft brush for soapstone, stereotypers' backing paper, filling tissue No. 1 extra white, facing tissue No. 1 extra cream, and some smooth heavy tea-lead.

To Prepare the Paste. Take $2\frac{1}{2}$ oz. of rye flour, $3\frac{1}{2}$ oz. of starch, $\frac{1}{2}$ teaspoonful powdered alum and 2 quarts of soft water, mix together thoroughly; then add cold water and mix until the mass becomes the consistency of thick cream; then gradually add the remainder of the water, which must be boiling hot, stirring well to prevent lumps; continue stirring until it begins to boil, then set off to cool; when cold strain through a fine sieve or cloth, when it should look like jelly. When ready for work add Spanish whiting until thick enough to spread with paste-brush.

To Make the Paper Matrix and Plaster Mold. When the plaster model is fully set go over the entire surface with the soft brush and soapstone, rub with the finger to remove surplus and give a gloss to the model. Cut a piece of the heavy backing paper large enough to entirely cover the plaster model; also cut from two to five pieces of the No. 1 white tissue, same size for filling (the rougher the model the more sheets will be needed to make a smooth matrix); also a sheet of the cream tissue facing paper and a piece of sheet-lead the same size of the paper. Soak the piece of heavy paper in water, dry off the surface with blotting paper; coat evenly with paste and apply a sheet of the No. 1 tissue; continue with the paste and paper until the requisite number of sheets have been built up; paste on a sheet of the cream tissue-facing, being careful to avoid wrinkles. Now dust the surface with a bag of fine powdered whiting; oil the plaster model lightly and quickly apply the prepared paper, smooth face to the model; beginning in the center smooth down snugly to the model. Now cut a piece of the tea-lead large enough to entirely cover the paper, press it down into the

center of the arch, slit wherever necessary to avoid folds or wrinkles, being careful to have it hug the paper closely all over; oil the lead, place in the casting-ring, and pour with plaster. If the plaster mold is to be removed in sections, to avoid an undercut, pour it with this object in view, making guides where it is necessary so the parts will fit together accurately.

Drying the Model and Pouring the Die. When the plaster is hard place it in the drying-oven for a few minutes—model side up—until the paper matrix is hard enough to separate; then remove the plaster model. Now wet the top edge of the paper matrix and plaster mold; mix plaster thin and build all around the edge to prevent the paper drawing away from the investment when pouring. Place the prepared mold back in the oven and when the matrix becomes hot pour the metal. Use good clean metal, do not have it too hot and the result will be a fine, clean-cut, smooth die.

In conclusion: To ascertain the right heat for pouring, fold a piece of white paper and dip into the ladle; if it comes out black the metal is too hot, if straw color it is just right. Be careful that the matrix is dry and warm before pouring; otherwise, the metal is liable to fly or the die be faulty. The oven I use for drying the matrix is made of Russia iron and has an aluminum cover, and is very useful for drying investments, packing vulcanite, etc.—*Ohio Dental Journal*, Dec. 1897.

TO PROTECT STEEL FROM RUST.—Professor Olmstead, of Yale, recommends resin melted with six or eight parts of lard as the best protection for iron or steel instruments, or implements of any kind, against rust. Objects anointed with it will remain free from corrosion for years.

TO PREVENT NAUSEA FROM USE OF RUBBER-DAM.—In *Welch's Monthly* Dr. Carmichael says: "Use oil-silk under the rubber-dam.—C. C. Jones, "Treatment by a reputable Christian scientist."—Dr. Wetherbee, "Substitute cottonoid."—Dr. Naumann, "Put perfume on the dam."—Dr. Grove, "Wash the dam thoroughly in rose-water."

TOADS.—The ancient belief that the toad was a venomous animal has been lately shown to be not altogether without foundation. The cutaneous glands of the toad do secrete a venom which is in a high degree toxic when introduced into the circulation. The production of venom is by no means confined to the common toad and land salamander, but is met with in allied species, the natterjack and tropical toads, and to a small extent the frogs. The creatures are unable voluntarily to eject the venom, which is secreted only in response to some reflex irritation and has a purely defensive function.—*Science Progress*.

Letters.

LETTER FROM CANADA.

To the Editor of the Digest, MONTREAL, Jan. 20, 1898.

DEAR MR. EDITOR:—As before stated, the dental board received power to start a college in 1892. They claimed that a certain number of the students (the French) were handicapped in receiving a dental education through not being able, like their fellow English students, to go to one of the American colleges, as they were not able to take the lectures in English. For this and other but less important reasons the legislature granted them the power, and in 1892 a college was opened with an English and French faculty (probably the only college in the world so constituted). That this (the joint faculties) has been a success no one for a moment will claim, and it certainly was a mistake to make it a joint affair, since, owing to race prejudice, one or the other of the nationalities is always dissatisfied with its representation among the officials. Take, for instance, the present session, the English students are in the majority, the ratio being 5 to 1, yet all the positions, from dean to janitor, with the exception of treasurer, are occupied by the French.

We think it would be much more congenial and better if they were separate, like the medical colleges. Some will say this is impossible, as there is not money enough to support separate colleges, but the Montreal public are liberal and have always given to worthy institutions when asked. The former dean always boasted that he never had and never would ask the public for donations; the present dean, being of French origin, while the wealth of the city and province is largely in the hands of the English, would hardly receive aid if he did ask. We know of men who stand ready to subscribe \$10,000, provided the present conditions of running a college are removed.

It was a mistake to grant the dental board the autocratic power they hold as regards the college. It is quite right that they should be a controlling body, i. e., have the right to control the examinations, but some of their by-laws are dictatorial in the highest degree, as for example: "The board shall not be in any way financially liable for the obligations of the college. The faculties shall annually, one month before the regular meeting of the board, send

a statistical and financial report of income and expenditure and assets to the board. The board shall appoint two auditors, one of themselves and one other, who shall annually inspect the property, affairs, books and accounts of the college and report."

It will be observed by the above that the members of the faculty are placed in a peculiar position—they receive nothing for their services and should the expenses amount to more than the fees, they must meet the deficit.

We think it is impossible to run a college confined to the province on the fees received from the students, there being such a limited number; the solution of the difficulty in our opinion is to ask for aid from our open-hearted wealthy citizens, and establish a first-class English college, or allow our students to attend the American colleges, should they choose to do so.

The students gave a very pleasant "At Home" last month, which was enjoyed by all who were present.

The Montreal Dental Club held their annual meeting on the 17th, when the following officers were elected for the year: President, Dr. P. Brown; vice-president, Dr. W. J. Giles; secretary-treasurer, Dr. R. L. Watson (re-elected). It is the purpose of the club to have a dinner on their next meeting night, the first Monday in February.

Fraternally, MONTREAL.

TEXAS LETTER.

SHERMAN, TEXAS, Jan. 9, 1898.

To the Editor of the Dental Digest,

DEAR SIR:—I promised several months ago to furnish you an occasional article from our state, and I will now try to give a brief account of the status of dentistry in Texas. We tried for several years to get our legislature to pass laws governing the practice in this state before we succeeded, and as almost every other state had laws before we did, Texas literally became the dumping ground for all the quacks who were unable to practice in other states. Consequently in 1889, when we did get a so-called law, we had more people practicing, according to population, than probably any other state.

The law of 1889 required that the governor should appoint a board in each judiciary district, consisting of three reputable dentists. As there were about fifty-two districts, the consequence was that a

of William McKinley as President of the United States—a man in whose ability and statesmanship I have had more confidence than any one since James G. Blaine left the political arena. But, as I have inferred, I have no desire to talk politics at this time.

Probably one of the most important events of the year was the opening of the Commercial Museum in this city. In no better way than through the work of this institution can the progress of civilization be marked. We will not speak of the Klondike gold fever, it is too great a field. We have been favored with new promises for the Keeley motor, but it has yet failed to mote to any advantage. Many of us have hoped that Keeley's visions were not vain; that he might, in a word, overcome some of the laws of nature, and that his principles could be applied in dental work. If we could only get rid of some of these uncomfortable laws, as Mr. Keeley expects to do (if he lives long enough), it would be hard to set a limit to the changed condition of the human race.

The Roentgen rays have received new application during the past twelve months, but the greatest achievements along electrical lines have been in the laboratories of Edison and Tesla. There seems to be no limit to the resources of these men's minds. You know it is not what we intend, but what we do, that makes us useful; and these great men are always doing something.

Now to turn more directly to our own field, Dr. Crouse may well be called the Edison of the dental profession. He has not only shown us many ways to improve our condition, and liberated us from what promised to be a chafing bondage, but has taken the helm in his own hand and through many storms has been our pilot.

There has not been very much along strictly professional lines which might be termed of importance, outside of our literature and college work. There have been several notable contributions to our literature, especially among the text books. New works and new editions of old standard books have come from able hands and are all filling an important place in dental education. Professor Truman, in the December *International*, says truly: "One of the most pleasing features for the present and the future is that the past year has given the dental profession an objective lesson in college work. At no period has there been greater efforts made to erect structures worthy of the labor to be performed in these training institutions. There is nothing which so gauges the real status of a profession as

great many incompetent men were put on the boards, and many others neglected their duty, so that it was possible for almost any one, no matter how incompetent, to practice here.

However, as we had a nucleus for a law, the state dental association kept hammering away until we succeeded last spring in having a new law, with which we are highly pleased, passed by our legislature. This law provides for a state board consisting of six dentists appointed by the governor, and the present members are: Drs. T. L. Westerfield, R. P. Hamill, Thos. Williams, M. S. Merchant, C. C. Weaver and Geo. S. Staples. They recently met at Dallas to issue certificates and transact other business, so as to start things running smoothly, and while they found many complications and difficulties, the work was gotten through with less trouble than was expected, and we now think we have one of the best dental laws in the United States.

More next time. Yours cordially,

TEXAS.

PHILADELPHIA LETTER.

Dear Digest:

PHILADELPHIA, Jan. 21, 1898.

The request for a letter for the first issue of the *DIGEST* in this new year is acceded to in the rush and pressure of a busy life because of the earnestness and politeness of the request. The beginning of a new year naturally suggests anticipation, but as my mind is in a retrospective mood I write you a little of the year just closed. When we say "closed," how hard it seems to realize the full significance of the word—that it has gone forever. History and memory we have with us, and we may have learned valuable lessons which can be carried over to the new ledger, but our manner of living, our acts, whether for good or evil, are all now unchangeable and must be laid away as a ledger, balanced and closed.

In our reverie we find many achievements and incidents which make the year 1897 memorable, not only to us as practitioners of a profession, but as citizens and members of the great family. While it is not my wish to give to this letter a political shade, as I hold the most liberal views upon the great subjects of politics and religion, believing that every intelligent citizen should be allowed the full exercise of his own views, yet, to the popular mind, I believe one of the most important happenings, both an achievement and an incident distinctly marking the departed year, was the inauguration

will be prepared, no doubt, with some hot shot along the lines of dental education and amalgams.

This brings us to the fact that we have been shown the first number of the official bulletin issued by the Committee on Colleges of the National Association of Dental Examiners. It is filled with pointed items of the work of this committee, and shows some of the inconsistencies of its so-called opponents, both in their writings and actions. Right is right and must triumph in the end; and they who seek personal ends will live to see the folly of their position. We notice that in all the talk and writings on this subject, it is the college professors and not the profession who are making all the objections to rules tending to raise the standard of preliminary education.

The annual meeting of the Central Dental Association will take place on the twenty-first of February. The menu is all that can be desired, and the speakers are world-wide in their fame. A good time is promised.

Dr. Louis Ottofy of Chicago will be present and speak along the lines of the everlasting "Faculties and Examiners" question. We await with interest what he has to say in regard to this all-absorbing subject.

Dr. Crouse will also speak on the Protective Association. This Association is well represented in New Jersey, and Dr. Crouse will find himself surrounded by friends, who will be especially interested in what he may have to present.

Mayor Seymour, of Newark, will be heard on the subject of "Our City." We have now reached the two hundred thousand mark.

It may not be amiss in passing to say that this society is one of the hustlers in the United States. To their bi-monthly meetings the members add the good fellowship and fraternal feeling which comes with and after a good dinner, which precedes each meeting.

Dr. William L. Fish, president of this society, has opened an office in New York, where for the present he will be three days each week.

Dr. Harvey Iredell, of New Brunswick, president last year of the state society, lost his wife a few weeks ago. He has the sympathy of a host of friends both in and out of the profession.

Dr. P. J. Wilson, late of Trenton, has again returned to Princeton, where for a number of years he practiced to the satisfaction of a large number of appreciative patients.

its buildings and appliances for teaching. Judged by this standard, the dental profession has grown the past year as in no period antedating this. The past is behind us, the present is ours, and the future of possibilities lies before us. He is wise who accepts all and labors patiently, well assured that amid it all progress is the eternal condition of mentality, and the apparent lapses are intrinsically but the outward signs of that activity that leads forever to a higher standard." Cordially yours for the future, THE SPECTATOR.

NEW JERSEY LETTER.

To the Editor of The Digest.

NEWARK, Jan. 12, 1898.

MR. EDITOR:—The spirit of progress is abroad in New Jersey, and anything and everything that pertains directly or indirectly to the advancement of dentistry and of dentists is hailed with delight. It is not our desire or custom to wait for all to pass and tardily or indifferently allow ourselves to be swept along by the tide of affairs, but to keep in the front and aid in every way to keep up the march.

The state society is active in its preparations for the annual meeting in July, which will be held at Asbury Park. It is doing everything possible to make the meeting a great success, and has already secured several papers from prominent men in the profession.

The twenty-fourth semi-annual meeting of the society will be held on the 22d of this month at Orange, when complete plans for the summer meeting will be made and further committees appointed. It will end with a banquet tendered by the president, Dr. J. L. Crater, of Orange, to the officers and executive committee. Dr. R. Ottolengui, of New York, will be one of the speakers and will take as his toast, "Dental Education versus Dental Legislation."

The legislative committee held a meeting last month, at which they laid plans to bring before the legislature a bill to amend our dental law. This amendment has been studied with great care, and we think will, if carried, be as complete a dental law as is now on the statutes of any state. There seems to be good reason to believe that it will be carried. It is our desire to have a clause by which dentists coming to us from other states may not be compelled to pass another examination, but be enabled to practice on a certificate from their board to our own.

The Central Dental Association will hold a meeting on the seven-teenth of January, at which Prof. Flagg will be the essayist, and he

Dr. W. G. Chase has removed to Philadelphia, where he has been several days each week for the past three years.

Cordially yours, HORNET.

BALTIMORE LETTER.

Dear Digest:

BALTIMORE, Jan. 21, 1898.

Did you ever know a bird of your acquaintance to be affected with elephantiasis? No? Well, I suspect that is what's the matter with me. My dermal structures have grown so thick that the shafts of gossips no longer penetrate them. Everywhere—on the streets, in the dental depots, in the society meetings, I hear dentists discussing "Oriole;" not always, sad to say, in a complimentary vein. Many are of the opinion that, according to the law of the woods, no one has the right to make such a sharp noise from behind a tree. Others, with resistless eloquence, force me to agree that "Oriole" is a busybody, altogether too smart and well informed, and has too good an opinion of his own views. Others, forgetful of social courtesies, talk shop and use their "dam(n)" on the poor defenseless bird.

Now to be sure, I did not contemplate all this racket when I assumed the role of an oriole; my only idea was that as the oriole was everywhere recognized as a Baltimore bird, the assumption of that name would just give to these letters, as it were, "a local habitation and a name." Now I am tempted to change it to sparrowhawk; but then upon reflection some of those written about might think I intended to belittle them, as this bird is known to live upon field mice and small birds.

This however was not my reason for thinking of the change, but as some of the ancients believed that the soul of man after death was converted into a sparrowhawk, and as I am assured that if I am exposed, death and destruction are sure to follow, I thought by making the change now I might escape the middle stage of "death and destruction" and further elude the inquisitive. What do you think of it?

Our board of dental examiners are still toying with the law and the young Westerner. In their answer to the proceedings for injunction they claim that "the certificates issued the young man from Ohio and Kentucky are not such as are contemplated by the Maryland law," and deny that he is fully equipped and in every way qualified to practice dentistry in Maryland. Won't you please step

across the river and tell those Kentucky folks what wretched, incompetent laws they are living under; and Ohio too, give them a blast. I am almost ashamed to write for a western journal, with such a stigma on the section!

That quite a number of our old practitioners sympathize with the board in its efforts to bar the young man from practice is not surprising; indeed, it is the opinion of a large number that too many men are entering the profession, and, like the tariff, "that's what makes times so hard." We feel sorry for these men, or any set of men who really fear competition. They can't help it; the lines on which their lives have been ordered lead right out into Mediocre Street, and they need protection. Without it they can't survive; too many people travel this thoroughfare. My brother, if you feel this fate or destiny settling down upon you, take "Oriole's" advice—"Anoint your face with the oil of gladness, put a little stiffness in your weak backbone, and get out of that thoroughfare." Don't hope to escape competition, but strive to be above it. Don't complain or cry if you are tripped, but be "game." I always liked gameness and that is why I liked the advice of Mr. Travers of New York. A friend consulted him about the purchase of a dog which he liked exceedingly, but when the dog was placed in a pit with a large rat, the rat whipped him. Still inclining to the purchase he asked Mr. Travers, "Now would you buy the dog?" "No," he replied, "b-b-buy the rat."

But to return to the thought of professional competition, I was very much amused to read an article in the religious press on overcrowding of the ministry. The writer takes the same ground that we have all heard occupied at dental meetings, that the profession is overcrowded, and in a climax makes this statement: "The ministerial world needs to-day just as much of a high tariff and protection as does the political world, for those already in or suffering from an unrighteous and unchristian competition." Surely the Salvation Army hasn't come too soon if this state of mind prevails in the ministry. Surely this man, forgetful of the anathemas to be heaped upon the head of him who takes from or adds to the Word, would make the Master's own words read: "Go ye unto all the world and preach the gospel, after the regularly licensed members have grown sleek and fat in the service." Bah! out upon professionalism that leads to such protection, and out upon those in dentistry who,

having themselves climbed over the wall, stand with their shoulders to the closed door and cry, "He that enters not in by the door is a thief and a robber."

We are glad to see in the last *International* that the president of the "Southern Branch of the National" has made his peace with the editor; but "alas and alack-a-day," in the *Dental Practitioner* "Buffalo Bull" has his excellency on his horns and under his feet in a twinkling. We wish he might have escaped the mad rush of the New York bovine, but things red (or yellow either, for that matter) mustn't hang around "B. B.'s" pasture if they don't expect to be charged. Then, too, one hasn't the breath or the inclination to explain, after a fall like this, that he really didn't mean to be red or yellow, that the sun or the foliage had heightened his accustomed sober hues, that "B. B.'s" misconception was due to nyctalopia, etc.

Gloria in excelsis! Our association had a meeting to-night to consider the report of the committee appointed to revise the dental law. The majority report contained some remarkable provisions, but as they were not adopted I will not criticise them. They deserved their fate, suffice it to say. The law as approved by the association is, I think, a tiptop one and is on the line hammered at by "Oriole" in his letters, up to the mark. "Graduates in dentistry who have secured by examination certificates from other state boards, need pass no further examination in Maryland." The sentiment in Maryland, as expressed by this action, is a justification of "Oriole's" contention that the state laws must become uniform, and I earnestly invite the attention of the National Association of Dental Faculties to this action, and request them to take steps to have similar amendments made in other states, thus building up a mutual confidence in each other which will do much to strengthen the national organization. The ultimate triumph of justice is a pleasant thing to behold and who that is fair could consent to the multiplication of examinations contemplated under the old order of things. If this law is approved and passed by our legislature it will make a happy bird of

ORIOLE.

NEW YORK LETTER.

To the Editor of the Digest, NEW YORK, Jan. 18, 1898.

MR. EDITOR:—We tender to the readers of the DIGEST our best wishes for the new year, which promises to be more prosperous than the last two or three have been.

The New York Institute of Stomatology held its second annual dinner at Delmonico's last evening. Several prominent men were present, among them being, Seth Low, Horace E. Deming, Rev. E. W. Warren, Prof. Henry F. Osborn, Dr. St. John Rossa, E. B. Merrill, Dr. Louis Jack, Dr. J. Morgan Howe and Dr. C. N. Peirce. Horace E. Deming was heartily applauded for an earnest speech upon "Professional Atmosphere and Morals," in the course of which he dealt with the varying incentives that animate professional men. He applauded the motives of the professional man, saying, "In business money talks, in a profession noblesse oblige. The true professional man would rather get a living in his profession than a fortune in trade."

The printer made us say in our December letter that we would give a synopsis of Dr. Nash's book, but we wish merely to call attention to a few points. After reading it carefully our conclusions are, that the disorder, scientifically considered as a whole, is based upon a degenerate condition of the nervous system, so far as applied to the functional office of the nerves to the organs connecting. The chapter on "Heredity" is worthy of more than a superficial attention, and we are impressed with the thought that "predisposition and environment" are to become the chief factors in the consideration of this order. Dr. Nash believes the trouble to be of modern origin, and we feel inclined to agree with him. The seven chapters on "Idiopathic Alveolitis" we especially commend to an intelligent perusal. From a long practice and careful study of this disease we are qualified to judge, and we wish to congratulate Dr. Nash and to make the prediction that this book will ultimately occupy a very important and helpful place in our literature.

We clipped the following from one of the New York papers:

DENTIST MUST PAY \$10,000 FOR BROKEN JAW. Miss Essie Abrams to-day obtained a verdict for \$10,000 in an action brought by her against Clarence Hackett, a dentist, for injuries to her jaw caused by his unskillful extraction of a tooth on July 21, 1894. Defendant was absent and an inquest was taken before Judge Beach and a jury to assess damages to be awarded to Miss Abrams, who claimed she had been injured to the extent of \$25,000.

Miss Abrams said the dentist broke a portion of her jawbone. She suffered extreme pain for a week and then called in Dr. Davis S. Schlegel, who declared she was suffering from necrosis of the jaw. Dr. Schlegel and Dr. Erhardt took away an inch and a half of the diseased bone. She said that she had since been unable to earn anything, as the injury to her face prevented her from following her profession as an actress.

Counsel submitted a certificate of the conviction of the defendant for practicing without a diploma.

In another paper we notice that the surgeons cut through the cheek and then failed to heal the wound. Our oral surgeons would have operated in the mouth and saved the young lady the deformity of a bad scar.

The papers are full of notices of the contest over Dr. Evans' will. The original will was so badly copied, and has so many amendments and codicils, that it is very doubtful if it is legal. It also appears that there were two wills, one for the United States and one for France.

We are disposed to call attention to the report and the proceedings of the Ontario Society, giving an account of a clinic by Dr. Melotte, of Ithaca, N. Y. If we could have more reports like this the journals would be more read and the dentists more edified.

The union meeting of the first and second district societies was held in Brooklyn this month.

The regular meeting of the New York Odontological Society was held January 18, and the paper of the evening was "Dr. Jenkin's System of Porcelain Inlays," by Dr. E. T. Darby, of Philadelphia.

Cordially,

NEW YORK.

TOUGH PLASTER CASTS.—Plaster casts may be made so tough that they will bear the driving of a nail into them without cracking by immersing them in a hot solution of glue for a sufficient time to permit it to permeate the entire mass.—*Scientific American*.

CHINESE DOCTOR'S TROUBLE—HE ASKS THE COURTS TO HELP HIM PROCURE A LICENSE.—Dr. Don Sang, a Chinese physician of Crown Point, Ind., whom the state board of medical examination has refused to license, has brought suit in the federal court to have the state registration law declared unconstitutional, and a temporary restraining order has been granted pending a final hearing in November. The complainant alleges that he is a native of Canton, China, and that his family represents nine generations of medical practitioners. His father was attached to the medical staff of the emperor. All of his family studied under the most rigid regime in the Sang hospital, which was established in 1406, and the laboratory of which contains no less than 3,178 specifics compounded from herbs, plants, barks, berries and roots of Chinese vegetation. Eight allegations are made wherein the present law is claimed to violate constitutional rights. Dr. Curryear, secretary of the state board, reports that Dr. Sang was refused a license for false representation to the clerk of Lake county, and that his application, being contradictory in itself, was also sufficient for turning him down.

The Dental Digest.

PUBLISHED THE

TWENTY-EIGHTH DAY OF EVERY MONTH.

Editorial.

INSTRUMENT NOMENCLATURE.

We publish in this issue a paper read by Dr. G. V. Black at the last annual meeting of the National School of Dental Technics, which gives a very complete system of instrument nomenclature. If adopted this will be of great benefit and convenience in teaching, and will enable the manufacturers to do away with the many useless forms. Furthermore, it will save the students much expense and time in operating, both of which are now wasted in the endeavor to find the instrument best adapted to the work in hand. The paper shows a vast amount of labor, such as but one man in a generation is willing to give.

If the National School of Dental Technics can have the system adopted by all the colleges, it will go far towards securing uniformity of teaching in this subject, and this can be accomplished only by this organization.

ANSWER TO "OUR APOLOGY."

There is an old fable of a crow which started on a journey to discover another bird that had lately come into the same forest. While flying over a pond he chanced to see his own ugly image mirrored in the water below. Mistaking his own reflection for the bird which he was seeking, the crow gazed for some minutes, then returning to his companions he described with much disgust the contemptible creature he had seen.

We are reminded of this fable by a recent editorial of our Friend Barrett in the *Dental Practitioner and Advertiser*, entitled "Our Apology." His editorial is as follows, but the words we have bracketed we think should have been omitted, "The Editor and Publisher of THE DENTAL DIGEST makes a personal attack upon the editor of this journal for criticizing the manner in which the new 'National Dental Association' was organized. We have earned the right to hold an independent opinion and to express our honest

convictions by many years of faithful attendance upon and earnest labor in the American Dental Association, [rather than] through political wire-pulling, office holding, and general pap-sucking. Our connection with dental societies is [not] that of one who endeavors to 'work' them for personal profit, for we have [no] mercantile or trade interests to conflict with our professional obligations. Hence we claim, and hope to be permitted to exercise, the right to voice our honest sentiments, though every dental depot organ in the land should endeavor to choke us off."

He should have added, "For I am the hired man of one of these mercantile houses; I edit their quarterly, which you know is their advertising catalogue; they pay me, and I would not be doing my duty if I did not follow their bidding. Furthermore, they are very kind; they let me talk ugly and be vulgar, even though I am the dean of a college; and besides receiving pay for editing their journal, it gives me a chance to accuse others of being mean and low bred, so you see the job is worth having."

As regards Editor Barrett's hopes and claims, we should be surprised if any other dental depot organ should wish or attempt to choke him off, if the *Dental Practitioner and Advertiser* does not.

PROPOSED AMENDMENT TO PATENT LAW.

The editor of the *Items of Interest* is still pushing the amendment to the patent law, and as correspondent to the New York State Dental Society we could understand his desire to start a discussion on some subject which had not been worn threadbare and thus give added interest to his office.

He urged a reform in our patent laws. It must have been quite gratifying to him to have had responses from so many presidents, pledging the support of their respective societies in the great work of reforming our patent laws, viz., "A petition to Congress for an act to restrain the granting of patents upon any method of treating human disease."

Now as there are no patents granted on methods of treating human disease, the correspondent of the New York State Dental Society would have better dropped this question with the reading of the report at the annual meeting, and thus have made no farther exposure of his lack of knowledge of patent laws. From the January number of the *Items*, however, we see that the imaginary

reform is still being pushed, and that the correspondent is not only bound to continue in his folly, but is in a fair way to make the dental profession an object of ridicule, by securing aid from different societies in a movement which is sheer nonsense. We are quoted as having taken part in the discussion when this report was read. We opposed the move then for the same reason as now, and stated at that time we could conceive of no form of treating human disease which could be patented. We entered our protest fully at that time and should not pursue the controversy farther, except for the fact that the odium of such folly will fall, in part at least, upon our profession. For, as the editor says, "The movement, then, is inaugurated by the several state dental associations of this country, and must in no manner be considered as the enterprise of this magazine."

If the enterprising officers of the journal in question were the only ones bound to be the subject of ridicule when the proposed bill is presented to Congress, we should be disposed to let them have it all their own way. But as thirty-two presidents of as many societies have responded, pledging their support, and as some of these societies have since appointed committees to work in the interest of the movement, it now takes the shape of a move on the part of the profession, and it is time that some authorized opinion be given. When the blind lead the blind both fall into the ditch.

It is worthy of note that one society, at Washington, D. C., after having the matter presented to them by their president, reported thus: "Our society instructs me to say that at present they are compelled to decline your suggestions, upon the ground that they know of no patents allowable by our government upon any method of treating disease, as far as they are informed, nothing but a process being patentable."—C. W. APPLER, Secretary, Washington, D. C. The correspondent recognizes that this change of expression from the society was probably given after having taken proper counsel.

The correspondent also stated in his report that he had a letter from a patent attorney at Washington, written in flattering terms of his editorial, but claiming as did the Washington society, that no such patents could be legal under existing laws.

We have taken the advice of our patent attorneys and they also say that there are no methods such as the correspondent of the New York society attempts to describe which could possibly be patented, and

they consider such a movement without merit and entirely useless. Therefore it is to be hoped that the agitation will not be pushed by the dental societies of this country.

Notices.

VERMONT STATE DENTAL SOCIETY.

The twenty-second annual meeting of the Vermont State Dental Society will be held at Hotel Berwick, Rutland, Vt., March 16-18, 1898. A cordial invitation to be present is extended to all dentists in this and neighboring states.

THOMAS MOUND, Secy.

CHICAGO ODONTOGRAPHIC SOCIETY.

The election of officers of this society for the ensuing year is as follows: Dr. G. W. Schwartz, President; Dr. H. J. Goslee, Vice-President; Dr. F. H. Zinn, Secretary; Dr. Geo. N. West, Treasurer; Dr. B. J. Cigrand, member of Board of Directors. Drs. E. K. Bennington, S. G. Johnson, F. E. Roach, Board of Censors.

F. H. ZINN, Secy.

ST. LOUIS DENTAL SOCIETY.

At the regular monthly meeting of this society, held Jan. 4, the following were elected officers for this year: Dr. John G. Harper, President; Dr. M. G. Marshall, Vice President; Dr. James C. Chisholm, Cor. Secy.; Dr. W. G. Cox, Rec. Secy.; Dr. A. J. Prosser, Treasurer. Drs. J. G. Pfaff, W. N. Conrad, J. P. Harper, Committee on Ethics and Election. Drs. J. H. Kennerly, F. F. Fletcher, Emma Eames Chase, Committee on Publication. Meetings to be held the first Tuesday evening of each month.

JAMES C. CHISHOLM, Cor. Secy.

HENRY S. CHASE, D.D.S.

Dr. Henry S. Chase died January 12, 1898, at his home in St. Louis.

He was born in Vermont before the war and came to St. Louis at the close of it. He was one of the first dentists in St. Louis and for years was one of the leaders in his profession. He devised many improvements in methods which he freely gave to the profession. Dr. Chase was a vegetarian in theory and practice, a pioneer among cremationists, a strong advocate of Henry George's doctrines, and in his later years the leader of a group of spiritualists.

His wife and four sons survive him, also his daughter-in-law, Dr. Emma Eames Chase.

MASSACHUSETTS BOARD OF DENTAL REGISTRATION.

A meeting of this body will be held in Boston, March 7, 1898, at 10 a. m., at Harvard Dental Infirmary, North Grove street. Examination in Operative Dentistry at 11 o'clock.

Each candidate must come prepared with rubber-dam, gold and instruments to demonstrate his skill in operative dentistry. Anyone who wishes may bring his patient. So far as possible patients will be furnished.

The Theoretic examination will include Anatomy, Physiology, Histology, Chemistry, Pathology, Materia Medica, Operative and Prosthetic Dentistry.

All applications, together with the fee of \$20, must be filed with the secretary of the board on or before March 1, as no application for this meeting will be received after that date. The next meeting will be held in June, 1898.

G. E. MITCHELL, D.D.S., Secretary,

25 Merrimack street, Haverhill, Mass.

FIFTH ANNUAL CLINIC BY ALUMNI ASSN. OF C. C. OF D. S.

The following clinics were held January 19, 1898, at the College Building: In the Infirmary—C. S. Case, Regulating; Aug. De Trey, Solila Crystal Gold and Instruments; C. P. Pruyn, Approximal Cavity Beneath Gum; E. Ma-Whinney, Root Fillings; C. T. Gramm, Soft Gold with Burnishers and Right Angle Mallet; C. N. Johnson, Models of Prepared Cavities; L. Ottofy, Implantation; L. E. Custer, Electric Furnace; J. W. Slonaker, Nitrous Oxid; J. A. Dunn, New Clamps; C. N. Thompson, Nasal Prosthesis; W. H. Taggart, Setting Crowns with Gutta Percha; W. VonB. Ames, Gold Inlay; G. Newkirk, Management of Deciduous Teeth; W. T. Reeves, Porcelain Inlay; D. C. Bacon, Watts Crystal Gold; G. T. Carpenter, Restoration of Gum Tissue; E. J. Perry, Cataphoresis; F. E. Roach, Bridge Work; G. W. Schwartz, Porcelain Art; H. R. Sackett, Regulating by Ligatures; J. S. Bridges, Open Faced Crown; C. J. Sowle, Logan Crown; N. Nelson, not announced.

In Surgical Amphitheater—T. W. Brophy, Oral Surgery.

In Furnace-Room—R. C. Brophy, Cast Aluminum; H. J. Goslee, Gold Plating.

In Bacteriological Room—E. L. York, (a) Bacteriological Exhibit, (b) Exhibit of Photomicrographs.

The annual Alumni Banquet was held at the Leland Hotel Wednesday, January 19, 1898, at 6:30 p. m.

RESOLUTIONS PASSED ON DR. EVANS' DEATH BY AMERICAN DENTAL CLUB OF PARIS.

At a special meeting of the American Dental Club of Paris, held at the office of its president, Dr. G. C. Daboll, on December 11, 1897, the following resolutions were unanimously adopted:

Whereas, by the sudden death of Thomas W. Evans, M.D., D.D.S., Ph.D., which occurred at his home in Paris Sunday evening, November 14, 1897, this club loses one of its most assiduous members and our profession one of the most remarkable men that has ever graced its ranks; therefore, be it

Resolved, That the American Dental Club of Paris deeply deplores the death of so eminent a colleague, who, as its first president and as a fellow member, ever alert to the interests of the club and the profession, always commanded the profound respect of all.

Resolved, That we, as a body of American dentists whose lot by various circumstances has fallen in a foreign land, while gratefully acknowledging the hospitality of our sister republic and our gracious adoption by her people, feel it but just to acknowledge our gratitude to Dr. Evans, who, as one of the

great pioneers of the dental profession, has done so much to break down old prejudices and prepare the way not only for us but for every dentist whose heart is in his work and whose object is to benefit mankind.

Resolved, That we regard his success in securing the recognition by all the nations of Europe, of the beneficence of dental science and art as first understood and practiced in America, as of the greatest importance to the public, as well as to the dental profession. That influence was strongest during the first twenty-five years of his practice, during the plastic period of the evolution of dental science so especially active in America. On account of his influence in the highest circles, the way has been made easier to convert conservative Europe to modern methods of conservative dentistry, and not only every member of this club and every American dentist in Europe, but every native dentist as well has been benefited by that influence. And we believe above all that by the adoption of modern methods such a stimulus has been given to all dentists of all nationalities as will one day render dental science a *universal* and not merely a *national* science, as it was during a great portion of Dr. Evans' career.

Resolved, That while we recognize the influence of others of his contemporaries, he played a principal role, owing to the peculiar position brought by his unparalleled success, such success being due to his personal magnetism, high-mindedness, affability, practical common sense and tact.

Resolved, That this club regard the numberless honors conferred upon Dr. Evans by the various sovereigns of Europe as the just tokens of appreciation of the dental profession through one of its great representatives, and it is proud that he was 'an American, and proud he was a member of this club. And, notwithstanding his pecuniary success, his unlimited honors, and his long sojourn away from his native land, we know that while being faithful to his duties in foreign lands, his loyalty and affection for his own country never diminished. He was first, last and always a dentist, and proud to be considered one, and despised that "snobism" which makes some men ashamed of the profession to which they owe all their success in life.

Resolved, That we believe the name of Dr. Thomas W. Evans deserves a place with other great names in the history of the development of dental science.

Resolved, That our sympathy be extended to the relatives and friends of Dr. Evans; that a copy of these resolutions be handed them, and that a full record be made and preserved by the secretary of the club in its procedures, and that a copy be sent to the dental journals of America for publication.

Resolved, That 'as a token of respect to our late confrere, the American Dental Club of Paris join in a body to attend his funeral.

JOHN W. CRANE,	} Committee.
ISAAC B. DAVENPORT,	
J. H. SPAULDING,	

CHICAGO ODONTOGRAPHIC SOCIETY.

The Odontographic Society of Chicago, which will celebrate its tenth anniversary on the 21st and 22d of February, is not only a notable feature in the professional life of Chicago, but holds high place among the scientific

bodies of the country. Its growth during the ten years of its existence, both in numerical strength and scientific importance, has been unusual, almost unprecedented.

In 1887 a group of thirteen men of that year's class of the Chicago College of Dental Surgery met in the office of one of the number and decided to form themselves into a society whose purposes should be mutual improvement along the lines of their profession and social intercourse. The new association was christened the Odontographic Society of Chicago by Dr. A. W. Harlan; Dr. Chas. E. Bentley was chosen president, Dr. Geo. N. West secretary, and Dr. J. E. Keefe treasurer.

Shortly after formation the society decided to admit other graduates of the Chicago College of Dental Surgery, by which arrangement the membership was soon considerably augmented. At the end of the third year the constitution was so modified as to permit the admission of graduates of all reputable dental colleges. Membership has increased steadily, and to-day the Odontographic Society numbers 250 members and is the largest dental society in the country with the exception of the National Dental Association.

One of the causes of the unprecedented success of the Odontographic Society, it may be said with safety, is the total elimination of all politics from its workings, recognizing as it does no existing faction in the dental profession of the city. Its membership has always been distinguished by a cordial good fellowship and a spirit of cooperation which has attained the highest results for all concerned. Every circumstance attending the coming celebration seems to indicate that this tenth anniversary will be not only an important event in the history of the Odontographic Society, but that it will make an epoch in the dental history of Chicago. Acceptances have been received from almost every state in the country. Men eminent in the profession in every section have signified their intention to be present.

It is the earnest desire of the Odontographic Society that all members of the profession in the city of Chicago should cancel the dates upon their appointment books for those two days and hold themselves in readiness to extend the hand of good fellowship to the strangers and to give what assistance they can in making the occasion a great and memorable success.

The sessions will terminate in a banquet on the evening of the second day.

Below is a list of clinics up to date:

CLINICS.—R. N. Lawrence, Lincoln, Ill., Demonstrating Treatment of "Pyorrhea;" A. W. McCandless, Chicago, Preparing Molar Root for Reception of Crown; B. J. Cigrand, Chicago, An Intra-Dental Band in Crown Work; L. P. Bethel, Kent, Ohio, Exhibit of Record Book for Dental Society Purposes; E. K. Wedelstaedt, St. Paul, Minn., Demonstration of Cavity Measurements; W. W. Shyrock, Fort Wayne, Ind., Bicuspid Gold Crown Porcelain Facing; Edward A. Royce, Chicago, The Wiping of Gold with Serrated Plugger Points; L. E. Custer, Dayton, Ohio, Exhibit of Electric Furnace; J. D. Patterson, Kansas City, Mo., Unannounced; I. B. Crissman, Chicago, Approximal Filling, Cohesive Foil, Hand Pressure; W. V. B. Ames, Chicago, A Method of Hastening the Hardening of Oxypophosphate; Grafton Munroe, Springfield, Ill.; E. H. Allen, Freeport, Ill., Cataphoresis; H. H.

Schumann, Chicago, Pulp Extraction by Cataphoresis; J. J. Reed, Rockford; R. C. Brophy, Chicago, Cast Aluminum; J. H. Wooley, Chicago, Desiccation of Pulp Canals of Devitalized Teeth; A. C. Hewett, Chicago; T. G. Wonderly, Galena, New Toothbrush; E. M. Robbins, Carthage, Demonstrate Method of Converting Swiss or English Jeweler's Broaches into Nerve Canal Cleaners; L. W. Skidmore, Moline, Method of Setting Up Artificial Teeth by the aid of the Patient's Natural Ones; Lelan O. Green, Chicago, Plate Vulcanized Between Metal; Chas. C. Chittenden, Madison, Wis., Treatment of Hypersensitive Dentin and Filling Tooth, Soft Foil, Hand Pressure; Garrett Newkirk, Chicago; J. D. Sperling, Chicago, Casting Crown Cups in Cuttle Fish Bone; C. M. Bailey, Minneapolis, Preparation of Cavity in Incisors; F. E. Roach, Chicago, New Method of Attaching Facings for Crowns; H. E. Matheson, Chicago, Setting Crowns in Gutta-Percha and Filling Roots; D. C. Bacon, Chicago, Gold Filling—Watt's Gold; J. E. Hinkins, Chicago, Restoring Corner Incisor Using Combination of Platinum and Gold; J. E. Cravens, Indianapolis; F. H. Stafford, Chicago, Dental Light and Heats; W. G. Bonwill, Philadelphia; J. J. Reed, Rockford; C. N. Thompson, Chicago; W. H. Taggart, Porcelain Work Exhibit; I. A. Freeman, Chicago, Treatment of Pyorrhea Alveolaris; C. P. Prun, Chicago, Combination Filling Amalgam and Gold; Elgin MaWhinney, Chicago; G. W. Schwartz, Chicago, Porcelain Crown, Porcelain Exhibit; G. T. Carpenter, Chicago, Restoration of Gum Tissue, Showing Models and Appliances; George W. Cook, Chicago, Bacteriological Exhibit; E. L. York, Chicago, Bacteriological Exhibit, Photo-Micrographic Exhibit; C. S. Case, Chicago, Exhibit of Original Appliances for the Measurement of Force as Applied to a Tooth; C. T. Gramm, Chicago, Right Angle Mallet Using Soft Foil; C. F. Hartt, Chicago, Root-Filling with Hill's Stopping, New Method; G. S. Salomon, Chicago, Approximal Gold Filling, Using Electric Mallet; J. S. Marshall, Chicago, Surgical Clinic; A. E. Morey, Chicago, Approximal Gold Filling (Bicuspid); C. N. Johnson, Chicago, Approximal Gold Filling (Molar); W. T. Reeves, Chicago, Restoration of Corner of Incisor with Porcelain; Edmund Noyes, Chicago, Preparation of Cavity in Molar or Bicuspid; T. L. Gilmer, Chicago, Surgical Clinic; G. A. Thomas, Chicago, Continuous Gum Plate Upon Platinum Foil; J. Austin Dunn, Chicago, Table Clinic and Exhibit; T. A. Broadbent, Chicago; J. W. Wassall, Chicago, Open Face Crown; J. B. Palmer, Chicago, Potpourri of Mechanical Appliances; A. B. Freeman, Chicago; E. J. Perry, Chicago, Cataphoresis; T. W. Brophy, Chicago, Surgical Clinic; A. H. Peck, Chicago, Demonstration—Replantation as a Cure for Chronic Alveolar Abscess.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

(Continued from page 839, Vol. III, No. 12.)

Dr. Barrett: I am quite surprised to hear all of this at this late day. I had not been here but two sessions when I inquired of my friends from New England what we were here for. We do not recognize any college, every candidate is examined; and now, to come down here and try and help out our brothers who recognize colleges and find that they want to drop the bars and set up another standard is somewhat surprising. Why, I thought you were all satisfied. I have heard no objection until this afternoon, and to hear

this going on now is a little surprising but quite pleasing, even at the eleventh hour. I am glad I didn't go away until someone expressed himself on it, and I hope when the association comes to deal with the report these gentlemen will follow up their talk this afternoon.

Dr. Brown: That is certainly a surprising speech, considering the fact that the resolution offered this morning trying to maintain the standard was laid upon the table and the very gentleman who has just spoken is the one who made the motion to lay upon the table.

Dr. Barrett: To know where they were—to lay it on the table until they knew that.

Dr. Brown: Well, you know now.

Dr. Dowsley: No, we have not heard the report yet.

The committee on conference here entered the room.

Dr. Donnelly: Your conference committee respectfully report that the following rules were approved by the two conference committees in joint session as a just and reasonable reconciliation of the differences of opinion between the Faculties' and the Examiners' associations which your committee was appointed to adjust. Your approval of the same will permit, we believe, a proper relation and favor the common objects of the two organizations:

Rule 1. Colleges desiring recognition by the National Association of Dental Examiners, which are not now on the recognized list, shall make application for such recognition through the committee on colleges, on blanks provided for that purpose.

Rule 2. The preliminary requirements prescribed by the National Association of Dental Faculties will be accepted by the National Association of Dental Examiners.

Rule 3. The statements set forth in the application of any college for recognition shall be verified, after investigation, by the board of dental examiners of the state in which the college is located, or by other persons designated by the National Association of Dental Examiners of the state in which the college is located, or by other persons designated by the National Association of Dental Examiners in case no such state board exists; and the recommendation of such board shall be essential to recognition.

Rule 4. The state boards in connection with this association are hereby required to become informed of the character of the dental colleges located in their respective states, as to their equipment, facilities, and methods of teaching, and shall report annually to this association wherein they fail to comply with these requirements.

Rule 5. Attendance of students upon three full courses of not less than six months duration each, in separate college years, shall be required before final examination for graduation.

Rule 6. Each dental college to be on the list of recognized colleges must have a teaching faculty composed of at least six individuals, and teaching the following branches: Operative Dentistry, Dental Pathology, Dental Prosthetics, and Oral Surgery. Also the six branches: Anatomy, Physiology, General Pathology (fundamental), Materia Medica and Therapeutics, and General Surgery. Their students must also be taught the subjects of chemistry and bacteriology in laboratories adapted to the purpose and under suitable instructors. That such college must possess, in addition, suitable lecture-rooms, well appointed dental infirmary and a general prosthetic laboratory; also must furnish in this way systematic instruction to its students.

Rule 7. Final action shall not be taken on the application of any college until such college has been admitted to membership in the National Association of Dental Faculties.

Rule 8. To be continued on the list of recognized colleges, all colleges must maintain these rules and conditions.

Rule 9. To more fully enforce these rules it is hereby directed that any college violating these rules shall be taken from the recognized list of colleges.

Note A. We consider it inadvisable for a member of an examining board to be connected with a dental college in any capacity whatever.

Note B. We recommend that each college in the list of recognized colleges state in its annual announcements that it complies with the rules and conditions of the National Association of Dental Examiners.

Note C. The date of recognition of any institution shall be placed on the list issued by this association; and the question of eligibility of the candidate for registration or for examination shall be left for each state board to determine for itself.

EVENING SESSION.

The president called the meeting to order and the secretary called the roll of states.

In compliance with precedent, we have herein given a list of the unrecognized institutions, and while it is important that your committee on colleges should have in its possession such a list for its information, and for the information of the various state boards, we most earnestly recommend that this portion of the report be not published in the printed proceedings.

DETAILED REPORT OF RECOGNIZED COLLEGES.

Students in Actual Attendance, Session 1896-7.		Freshmen	Juniors.	Seniors.	Specials.	Totals.	Graduates.
1	Baltimore College of Dental Surgery, Baltimore, Md.....	65	82	67		214	57
2	Boston Dental College, Boston, Mass.	53	73	65		191	57
3	Chicago College of Dental Surgery, Chicago, Ill.....	185	173	155		463	142
4	College of Dentistry, Department of Medicine, University of Minnesota, Minneapolis, Minn.....	43	24	28	1	96	28
5	Columbian University, Dental Department, Washington, D. C.....	19	21	15		55	11
6	National University, Dental Department, Washington, D. C.....	15	15	10		40	9
7	Northwestern University, Dental School, Chicago, Ill.....	180	188	153		521	130
8	Southern Medical College, Dental Department, Atlanta, Ga.....	41	16	21		78	19
9	University of Tennessee, Dental Department, Nashville, Tenn.....	38	19	14		71	14
10	Harvard University, Dental Department, Cambridge, Mass.....	50	41	39	1	131	32
11	Indiana Dental College, Indianapolis, Ind.....	71	58	54		183	54
12	Kansas City Dental College, Kansas City, Mo.....	28	35	40		103	39
13	Louisville College of Dentistry, Louisville, Ky.....	67	57	36		160	36
14	Missouri Dental College, St. Louis, Mo.....	39	43	19		101	19
15	New York College of Dentistry, New York, N. Y.....	68	70	110		248	82
16	Northwestern College of Dental Surgery, Chicago, Ill.....	21	16	20		57	15
17	Ohio College of Dental Surgery, Cincinnati, O.....	82	78	51		211	50

18	Pennsylvania College of Dental Surgery, Philadelphia, Pa.....	119	100	103	4	326	111
19	Philadelphia Dental College, Philadelphia, Pa.....	116	153	146		415	135
20	Meharry Dental Department, Central Tennessee College, Nashville, Tenn.....	6	5	6		17	6
21	University of California, Dental Department, San Francisco, Cal....	58	56	44		158	43
22	University of Iowa, Dental Department, Iowa City, Iowa	54	89	35		178	34
23	University of Maryland, Dental Department, Baltimore, Md	62	79	69		210	62
24	University of Michigan, Dental Department, Ann Arbor, Mich	80	56	58		194	50
25	University of Pennsylvania, Dental Department, Philadelphia, Pa....	152	108	103	3	366	98
26	Vanderbilt University, Dental Department, Nashville, Tenn.....	65	59	42	4	170	42
27	Western Dental College, Kansas City, Mo.....	50	70	52		172	52
28	University of Denver, Dental Department, Denver, Col.....	13	6	9		28	8
29	Detroit College of Medicine, Department of Dentistry, Detroit, Mich.....	30	25	26		81	22
30	Western Reserve University, Dental Department, Cleveland, O.....	21	32	33	23	109	32
31	University of Buffalo, Dental Department, Buffalo, N. Y.....	61	68	70		199	70
32	University College of Medicine, Dental Department, Richmond, Va.....	10	8	11		29	7
33	Birmingham Dental College, Birmingham, Ala.....	19	13	8		40	7
34	Cincinnati College of Dental Surgery, Cincinnati, O.....	25	17	27		69	27
		1,956	1,953	1,739	36	5,684	1,600

Figures supplied from announcement and DENTAL DIGEST, the official report having been refused.

Note—Special students include first graduates and are not included in "totals."

Following is a list of schools which have ceased to exist:

Recognized List, 1893—Minnesota Hospital College, Dental Department, Minneapolis; St. Paul Medical College, Dental Department, St. Paul, Minn.

Unrecognized List, 1894—Homeopathic Hospital College, Dental Department, Cleveland, O.; United States Dental College, Chicago, Ill.

Recognized List, 1895—The American College of Dental Surgery, Chicago, Ill.

Unrecognized List, 1895—Cincinnati College of Medicine and Surgery, Dental Department, Cincinnati, O.; The Baltimore Homeopathic School, Dental Department, Baltimore, Md.

Recognized List, 1896—Washington Homeopathic Medical College, Dental Department, Washington, D. C.

Unrecognized List, 1896—Cleveland University of Medicine and Surgery, Dental Department, Cleveland, O.

We have had under consideration applications for place on our list of recognized colleges from the following schools:

University of Colorado, Colorado School of Medicine, Department of Dentistry, Denver, Col.

Howard University, Dental Department, Washington, D. C.

Atlanta Dental College, Atlanta, Ga.

Baltimore Medical College, Dental Department, Baltimore, Md.

Marion Sims College of Medicine, Dental Department, St. Louis, Mo.

Omaha University, Dental Department, Omaha, Neb.

The New York Dental School, New York City.

Pittsburg Dental College, Department of Dentistry.

Western University of Pennsylvania, Pittsburg, Pa.

Tennessee Medical College, Dental Department, Knoxville, Tenn.

Tacoma College of Dental Surgery, Tacoma, Wash.

Milwaukee Medical College, Dental Department, Milwaukee, Wis.

The applications having been made in proper form upon our blanks, questions fully answered and proper recommendation for recognition having been made by the state board, and being members of the National Association of Dental Examiners, we, after most careful scrutiny, recommend the recognition of the following colleges:

The Atlanta Dental College, Atlanta, Ga.

The Baltimore Medical College, Dental Department, Baltimore, Md.

The Marion Sims College of Medicine, Dental Department, St. Louis, Mo.

The New York Dental School, New York City.

The Milwaukee Medical College, Dental Department, Milwaukee, Wis.

In the case of the University of Colorado, Colorado School of Medicine, Dental Department, Colorado, we find the preliminary requirements not up to the required standard. The school, however, having shown every disposition to comply with our rules, we would recommend that the committee on colleges be authorized to place their name on the recognized list upon receipt of a statement from them that they will comply with rule 2.

In regard to the Tennessee Medical College, Dental Department, Knoxville, Tenn., we would state that they have complied with all of our rules and requirements except rule 2. This they are unable to certify to, as they claim that the grade does not exist in their state. We would therefore suggest that Dr. Kesterson, the dean of the college, be given an opportunity to present the case before this body before final action is taken, as the committee on colleges are unwilling to assume the responsibility of not reporting favorably an institution which they believe to be up to the requisite standard with the exception of a technical point

L. ASHLEY FAUGHT, Ch'n, } Committee on Colleges.
G. CARLETON BROWN, }

On motion the following colleges were accepted as on the recognized list of colleges:

The Atlanta Dental College, of Atlanta, Ga.

The Baltimore Medical College, Dental Department, Baltimore, Md.

The Marion Sims College of Medicine, Dental Department, Missouri.

The New York Dental School, New York City.

The Milwaukee Medical College, Dental Department, Milwaukee, Wis.

On motion a vote of thanks was extended to the proprietor of the Hotel Chamberlin for the use of the meeting room

On motion the resignation of Dr. Faught, as chairman of the committee of colleges, was taken from the table and accepted.

Adjourned sine die.

CHARLES A. MEEKER, Secretary.

CHICAGO has entered a claim as a meeting-place for the fourteenth international medical congress in 1903.